TXDOT RIGHT-OF-WAY DATA REPORT

Prepared for

U.S. Environmental Protection Agency, Region 6
McGinnes Industrial Maintenance Corporation
International Paper Company

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LIST OF ACRONYMS AND ABBREVIATIONS

Anchor QEA	Anchor QEA, LLC
BEHP	bis(2-ethylhexyl) phthalate
CAS	Columbia Analytical Services Inc.
COPC	contaminants of potential concern
DGPS	differential global positioning system
DNR	do-not-report
EcoChem	EcoChem, Inc.
FL	Field Lead
FSP	Field Sampling Plan
HASP	Health and Safety Plan
I-10	Interstate Highway 10
IPC	International Paper Company
kg	kilogram
MIMC	McGinnes Industrial Maintenance Corporation
NELAP	National Environmental Laboratory Accreditation Program
ng	nanogram
PCB	Polychlorinated biphenyl
QC	quality control
RI/FS	Remedial Investigation and Feasibility Study
FL	reporting limit
ROW	Right-Of-Way
RPD	relative percent difference
SDG	sample delivery group
Site	San Jacinto River Waste Pits Superfund Site
SVOC	semivolatile organic compounds
TCEQ	Texas Commission on Environment Quality
TCRA	time critical removal action
TEQ	toxicity equivalent
Tract	Virgil C. McGinnes, Trustee tract
TXDOT	Texas Department of Transportation
µg	microgram

USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compounds

1 INTRODUCTION

This document presents the results of a soil sampling effort within the right-of-way (ROW) of the Texas Department of Transportation (TxDOT). The ROW is adjacent to Interstate Highway 10 (I-10) Bridge over the San Jacinto River in Harris County, Texas, and is near the Virgil C. McGinnes, Trustee tract (Tract), which is part of the San Jacinto River Waste Pits Superfund Site (the Site). This data report was prepared on behalf of McGinnes Industrial Maintenance Corporation (MIMC) and International Paper Company (IPC) by Anchor QEA, LLC (Anchor QEA).

1.1 Site Description

The Tract is located immediately north of the I-10 Bridge on the western bank of the San Jacinto River in Harris County, Texas. The Tract was used for approximately eight months in 1965 and 1966 for the disposal of paper mill waste sludge. The waste was reportedly brought to the Tract by barges from which the waste was pumped into the surface impoundments on the Tract (TCEQ and USEPA 2006). A complete description of the Site history is provided in the Draft Remedial Investigation/Feasibility Study (RI/FS) Work Plan for the Site (Anchor QEA and Integral 2010).

1.2 Objectives and Overview

The primary purpose of this sampling effort was to document conditions in the ROW for purposes of an access agreement with TxDOT. The access agreement will permit MIMC and IPC to conduct RI/FS and time critical removal action (TCRA) activities.

The objectives of this sampling effort were to:

- Collect soil samples from 12 locations within the TxDOT ROW and the RI/FS preliminary Site perimeter (Figure 1).
- Analyze samples from each location from 0 to 12 inches below grade for dioxins and furans (as TEQs), and the other primary and secondary contaminants of potential concern (COPC) identified for the Site in the RI/FS process (Table 1).
- Analyze samples from three of the subsurface sample locations (TxDOT004, TxDOT005, and TxDOT012) from 48 to 60 inches for dioxins and furans (as TEQs),

and the other primary and secondary COPCs identified for the Site in the RI/FS process (Table 1).

Section 2 of this data report describes the field procedures that were followed by the technical team during the field study and any deviations from the methods described in the TxDOT Right of Way Field Sampling Plan (FSP; Anchor QEA 2010b). Section 3 summarizes the data validation results. The analytical results of the soil samples are provided in Section 4.

2 SOIL SAMPLING PROCEDURES AND LABORATORY METHODS

The following sections provide a description of the procedures and methods that were used during this sampling event and any deviations from the TxDOT ROW FSP (Anchor QEA 2010b). A detailed description of the procedures and methods is provided in the TxDOT ROW FSP (Anchor QEA 2010b). All field activities were conducted in accordance with the Health and Safety Plan San Jacinto River Waste Pits Superfund Site (HASP; Anchor QEA 2009). Station locations and sampling matrices are outlined in Table 1.

2.1 Field Survey and Sampling Methods

Soil samples were collected from the TxDOT ROW on August 11, 2010, and August 12, 2010. Station locations were equally spaced along the TxDOT ROW (Figure 1). The sampling equipment consisted of a hand auger and utensils. Protective wear (e.g., gloves) and clean sampling procedures were utilized, and sampling equipment was decontaminated between samples to minimize the possibility of cross-contamination between sampling locations.

Latitude and longitude coordinates were obtained at the locations where samples were collected. A differential global positioning system (DGPS) was used to document the sample collection locations. The standard projection method used during field activities was Horizontal Datum: NAD1983_StatePlane, Texas South Central, FIPS 4204, U.S. feet.

Fourteen samples from 12 locations (Figure 1) along the TxDOT ROW were sampled using a hand auger for collection of both the 12 surface soil samples (0 to 12 inches) and the two subsurface samples (48 to 60 inches). A decontaminated stainless-steel spoon was used to collect the soil from the auger. Soil was placed into a decontaminated stainless-steel bowl and homogenized using a stainless-steel spoon until the soil attained a visually uniform color and texture. Soil subsamples were then removed for analyses by placement in labeled, laboratory-cleaned sample container. Each sample container was clearly labeled with the task name, sample number, type of analysis to be performed, date and time, and the initials of the person preparing the sample. Samples were then immediately placed in a cooler on ice (4±2°C). Samples were shipped to Columbia Analytical Services, Inc. (CAS) for analysis.

Both the surface and subsurface samples were analyzed for percent solids, metals, dioxins and furans, semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), pesticides, and polychlorinated biphenyls (PCBs). A complete list of the chemicals included in the analyses is provided in Table 2.

2.2 Field Quality Control Samples

Field quality control (QC) samples were used to assess sample variability and evaluate potential sources of contamination. One of each of the following field QC samples were collected: field split samples, standard reference materials for the dioxin/furan analyses, equipment filter wipe blanks and filter blanks. Samples were collected in the field and analyzed by the analytical laboratory.

2.3 Deviations from the FSP

The following provides a summary of two deviations from the original methods outlined in the TxDOT ROW FSP (Anchor QEA 2010b) that were required for sampling to be safely completed:

- Several underground utilities were located in close proximity to the soil sample station locations, and Anchor QEA and TxDOT field representatives were concerned that use of a geoprobe to collect the subsurface (48 to 60 inches) samples could potentially puncture those utilities. It was determined that a hand auger should be employed for collection of all the samples, both surface and subsurface, to minimize the chance of potential damages to underground utilities and sampling equipment, and to protect sampling personnel.
- TxDOT requested subsurface samples be collected at three locations, TxDOT004, TxDOT005, and TxDOT012. However, while attempting to collect the subsurface sample at station TxDOT005 using the hand auger, concrete rubble and other solid obstructions were encountered at 18 inches below grade. More attempts were made at other nearby locations; however the rubble was persistent throughout the area. Because refusal was met after multiple attempts, a subsurface sample was not collected at that location. Use of a geoprobe in these conditions would have yielded similar results. Subsurface samples were successfully collected at the other two locations as requested by TxDOT.

The Anchor QEA Field Lead (FL) discussed these deviations from the FSP with Rod Kimbro, TxDOT's field oversight, prior to implementing them. Mr. Kimbro approved the deviations. Descriptions of these events are provided in the Daily Field Logs (Appendix A). These deviations do not affect the outcome or conclusions of this study.

2.4 Laboratory Methods

Analytical methods outlined in the TxDOT ROW FSP (Anchor QEA 2010) were followed.

3 ANALYTICAL DATA VALIDATION AND DATA MANAGEMENT

Analyses were performed by CAS in Kelso, Washington and Houston, Texas. CAS-Kelso is accredited under the State of Washington Department of Ecology, Certificate No. C544-10. CAS-Houston is accredited under the National Environmental Laboratory Accreditation Program (NELAP), Certificate No. T104704215-10-1. Two data reports were received from CAS and sent to EcoChem, Inc. (EcoChem) for third-party data validation. All data presented in this report reflect any findings reported by EcoChem.

Third-party data validation was performed on each data set of chemical analyses. Data validation verified the accuracy and precision of chemical determinations performed during this investigation. This section presents the data validation results conducted by EcoChem. The following sections summarize the overall data quality and do not necessarily address each individual sample result affected by data qualification. A detailed description of the analytical methods is provided in the TxDOT ROW FSP (Anchor QEA 2010). The full data validation report is provided in Appendix B.

3.1 Overall Data Quality

Fifteen samples were submitted to CAS in Kelso, Washington for the following analyses: SVOCs, VOCs, and PCBs. The data for these analyses were reported under one sample delivery group (SDG), K1008732. The same fifteen samples were also submitted to CAS in Houston, Texas for the following analyses: dioxin/furans, PCB congeners, metals, and total solids. The data for these analyses were reported under two sample delivery groups (SDGs): K1008732 and E1000886.

The data were reviewed by EcoChem using guidance and quality control criteria documented in the analytical methods of the Sampling and Analysis Plan: Sediment Study San Jacinto River Waste Pits Superfund Site (Integral/Anchor QEA 2010); USEPA National Functional Guidelines for Chlorinated Dioxin/Furan Review (USEPA 2005), National Functional Guidelines for Organic Data Review (USEPA 1999), and USEPA National Functional Guidelines for Inorganic Data Review (USEPA, 2004). The data validation results were reported in EcoChem project report number C22130-3.

Any data qualifiers applied to the data during the final validation procedures have been incorporated into the final database for the overall San Jacinto River Waste Pits RI/FS project. Data qualifiers assigned as a result of the data validation and their definitions are shown on the analytical results table (Table 2). All data were considered usable as reported or as qualified. The data may have been qualified as estimated for a particular analysis based on method or technical criterion as stated in the functional guidelines (USEPA 1999, 2004, 2005). Data qualified with a "J" indicates that the associated numerical value is the approximate concentration of the analyte. Data qualified with a "UJ" indicated the approximate reporting limit below which the analyte was not detected. In some cases, reporting limits were raised to account for method blank contamination or matrix interference. Any such cases are described in Appendix B, Data Validation Report.

3.2 Sample Transport and Holding Times

Samples were received at the laboratories intact and appropriately preserved with one exception. The laboratory received sample coolers with temperatures less than the lower limit, at -0.3°C and -0.4°C. These outliers did not impact data quality, therefore no qualifiers were assigned. All samples were analyzed within the holding times.

3.3 Field Blank Results

Filter wipes were submitted for field blanks for SVOC, metals, and dioxin/furan analyses. To evaluate the effect on the sample data, action levels of five times the blank concentration were established. For sample SOFW-901A, positive results remained for carbazole, naphthalene, and phenanthrene after qualifiers based on method blank contamination were issued. No field sample results were qualified based on filter wipe blank contamination; these associated results were either not detected or detected at levels greater than the action level. Sample FB-902 was a master filter wipe blank used to evaluate SOFW-901A for metals. Magnesium, nickel, and zinc were qualified as not detected in Sample SOFW-901A. Positive results for aluminum and manganese remained after qualifiers based on FB-902 were issued. Field sample results for aluminum and manganese were greater than the action levels; no additional qualifiers were applied. No target analytes for the dioxin/furan analyses were detected in SOFW-901A after qualifiers based on method blank contamination were issued.

3.4 Field Duplicate Results

One set of field replicates, TxDOT006-SO-0-6-N and TxDOT006-SO-0-6-D, were submitted. Duplicated were analyzed for the same parameters as the parent sample and results were evaluated using the relative percent difference (RPD) values less than 50% for results greater than five times the reporting limit (RL) or the absolute difference between the sample and replicate was less than two times the RL for results less than five times the RL. All field precision criteria were met, except for barium and cobalt, at 51.8% and 131%, respectively. No data were qualified based on field replicate precision outliers

3.5 Laboratory Quality Control

The validation report indicates that the majority of the data results did not require qualification. Some data were qualified as estimated. All positive results for 2,3,7,8-TCDF results were flagged as do-not-report (DNR) due to linear calibration range outliers, but a more appropriate result for this analyte was reported from another analysis or dilution. All other data, as reported, were found acceptable for use.

4 RESULTS

The results of chemical analyses conducted on the fourteen soil samples following sample collection and processing are provided in Table 2.

5 REFERENCES

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USEPA, 2009. Guidance on Recommended Interim Preliminary Remediation Goals for Dioxin in Soil at Comprehensive Environmental Response, Compensation, and Liability Act (CERLA) and Resource Conservation and Recovery Act (RCRA) Sites. December 2009.

TABLES

Table 1

Sample Locations and Sampling Matrix

Station	Northing[1]	Easting[1]	Upper Depth (cm)	Lower Depth (cm)	Percent Solids	Metals[2]	SVOCs[2]	VOCs[2]	Carbazole	PCBs[2]	Dioxins/Furans[2]
TxDOT001	13857786.6	3215260.1	0	30.5	X	X	X	X	X	X	X
TxDOT002	13857673.8	3215739.8	0	30.5	X	X	X	X	X	X	X
TxDOT003	13857478.7	3216253.4	0	30.5	X	X	X	X	X	X	X
TxDOT004	13857240.3	3216760.2	0	30.5	X	X	X	X	X	X	X
			121.9	142.2	X	X	X	X	X	X	X
TxDOT005	13857054.8	3217166.6	0	30.5	X	X	X	X	X	X	X
TxDOT006	13856660.4	3217950.9	0	15.2	X	X	X	X	X	X	X
TxDOT007	13857579.2	3215250.2	0	30.5	X	X	X	X	X	X	X
TxDOT008	13857485.0	3215750.3	0	30.5	X	X	X	X	X	X	X
TxDOT009	13857278.2	3216228.9	0	30.5	X	X	X	X	X	X	X
TxDOT010	13857042.9	3216733.5	0	15.2	X	X	X	X	X	X	X
TxDOT011	13856883.3	3217084.3	0	20.3	X	X	X	X	X	X	X
TxDOT012	13856529.8	3217815.6	0	30.5	X	X	X	X	X	X	X
			121.9	152.4	X	X	X	X	X	X	X

Notes:

1 - NAD83 TX State Plane South Central US Feet

2 - See Table 2 for a complete analyte list

Table 2
Analytical Results for Soil Samples

Task:	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010
Location ID:	TxDOT001	TxDOT002	TxDOT003	TxDOT004	TxDOT004	TxDOT005	TxDOT006
Sample Date:	8/11/2010	8/11/2010	8/11/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010
Upper Depth (cm)	0	0	0	0	121.92	0	0
Lower Depth (cm)	30.48	30.48	30.48	30.48	142.24	30.48	15.24
Conventional Parameters							
Percent Solids (%)	74.2	87.3	74.3	86.9	76.4	68	85.3
Metals (mg/kg)							
Aluminum	5100	3560	3040	3430	2240	9070	2280
Arsenic	1.98	3.62	1.71	1.73	1.62	3.68	2.12
Barium	104	213	72.4	58.3	42.9	252	255
Cadmium	0.06 J	0.41 J	0.07 J	0.04 J	0.07 J	0.44 J	0.145 J
Chromium	5.75	17.8	5.8	4.7	4.9	61.7	9.3
Cobalt	2.3	5.6	3.1	4.5	2.2	3.4	32.2
Copper	6	14.1	7.6	4.8	4.5	20.5	15.6
Lead	20 J	164	16 J	7.1 J	19	273	43.5
Magnesium	1180 J	2010 J	1290 J	1390 J	1110 J	3000 J	1400 J
Manganese	86.9	410	139	201	73.7	121	970
Mercury	0.028	0.035	0.011 J	0.007 J	0.017 J	0.081	0.02 J
Nickel	3.96 J	8.87	4.65	4.92	3.18 J	11.9	9.7
Thallium	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.3 U
Vanadium	15	22.7	11.1	9.3	9.1	26.2	33.4
Zinc	25.2	164	54	18.5	40.1	188	76.5
Semivolatile Organic Compounds (µg/kg)							
1,2,4-Trichlorobenzene	0.31 U	0.26 U	0.31 U	0.26 U	0.28 U	0.34 U	0.26 U
1,2-Dichlorobenzene	0.3 U	0.24 U	0.3 U	0.25 U	0.27 U	0.33 U	0.25 U
1,3-Dichlorobenzene	0.32 U	0.27 U	0.32 U	0.27 U	0.3 U	0.36 U	0.27 U
1,4-Dichlorobenzene	0.34 U	0.28 U	0.34 U	0.28 U	0.31 U	0.37 U	0.28 U
2,3,4,6-Tetrachlorophenol	46 U	46 U	46 U	46 U	46 U	51 U	46 U
2,4,5-Trichlorobenzene	18 U	18 U	18 U	18 U	18 U	19 U	18 U
2,4,6-Trichlorophenol	15 U	15 U	15 U	15 U	15 U	16 U	15 U
2,4-Dichlorophenol	17 U	17 U	17 U	17 U	17 U	19 U	17 U
Acenaphthene	14 U	37 J	14 U	14 U	250 J	15 U	14 U
Bis(2-ethylhexyl) phthalate	19 J	98 J	66 J	51 J	100 J	130 J	64.5 J
Fluorene	13 U	28 J	13 U	13 U	130 J	15 U	13 U
Hexachlorobenzene	15 U	15 U	15 U	15 U	15 U	17 U	15 U
Naphthalene	15 U	15 U	15 U	15 U	15 U	16 U	15 U
Pentachlorophenol	130 U	130 U	130 U	130 U	130 U	140 U	130 U
Phenanthrene	10 U	340	77 J	11 J	770	83 J	28.5 J
Phenol	20 U	20 U	20 U	20 U	20 U	22 U	20 U
Volatile Organic Compounds (µg/kg)							
1,2,3-Trichlorobenzene	0.28 U	0.23 U	0.28 U	0.24 U	0.26 U	0.31 U	0.24 U
Chloroform	0.3 U	0.24 U	0.3 U	0.25 U	0.27 U	0.33 U	0.25 U
Pesticides (µg/kg)							
Carbazole	12 U	60 J	17 J	12 U	59 J	22 J	12 U

Table 2
Analytical Results for Soil Samples

Task:	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010
Location ID:	TxDOT001	TxDOT002	TxDOT003	TxDOT004	TxDOT004	TxDOT005	TxDOT006
Sample Date:	8/11/2010	8/11/2010	8/11/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010
Upper Depth (cm)	0	0	0	0	121.92	0	0
Lower Depth (cm)	30.48	30.48	30.48	30.48	142.24	30.48	15.24
PCBs							
Aroclor 1016 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1221 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1232 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1242 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1248 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1254 (µg/kg)	19 U	**130**	19 U	19 U	**46 J**	19 U	19 U
Aroclor 1260 (µg/kg)	19 U	19 U	19 U	19 U	19 U	**44 J**	19 U
Aroclor 1262 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1268 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
PCB077 (ng/kg)	**25 J**	**81.4 J**	**36.5 J**	**54.5 J**	3.48 U	**133 J**	**21.1 J**
PCB081 (ng/kg)	1.23 U	**4.06 J**	1.88 U	2.31 U	1.23 U	**4.05 J**	1.3 U
PCB105 (ng/kg)	**185 J**	**654**	**190**	**4330**	**16.2 J**	**588**	**140 J**
PCB114 (ng/kg)	**8.7 J**	**39.7 J**	9.81 U	**252 J**	1.25 U	**27.1 J**	**4.95 J**
PCB118 (ng/kg)	**323 J**	**1310**	**433 J**	**10500**	**43.1 J**	**1010**	**266 J**
PCB123 (ng/kg)	**8.38 J**	**28.9 J**	**9.21 J**	**154 J**	1.25 U	**33.3 J**	**5.45 J**
PCB126 (ng/kg)	6.55 U	**15.5 J**	1.78 U	7.27 U	1.21 U	**24.5 J**	**3.58 J**
PCB156/157 (ng/kg)	**125 J**	**495 J**	**96.1 J**	**1840**	**9.12 J**	**531 J**	**106 J**
PCB167 (ng/kg)	**44.4 J**	**175 J**	**29.2 J**	**524 J**	2.9 U	**231 J**	**37.4 J**
PCB169 (ng/kg)	0.953 U	2.63 U	0.874 U	2.05 U	0.805 U	**9.52 J**	0.924 U
PCB189 (ng/kg)	**13.5 J**	**53.5 J**	7.09 U	**54.5 J**	0.684 U	**105 J**	**18.3 J**
Dioxins/Furans (ng/kg)							
1,2,3,4,6,7,8-HpCDD	**16.8**	**134**	**22.4**	**28.9**	**18.6**	**163**	**48.2**
1,2,3,4,6,7,8-HpCDF	**3.95 J**	**22.4**	**1.87 J**	**4.05 J**	0.395 U	**25.2**	**5.16 J**
1,2,3,4,7,8,9-HpCDF	0.264 U	**1.53 J**	0.185 U	**0.685 J**	0.0814 U	**1.87 J**	**0.447 J**
1,2,3,4,7,8-HxCDD	**0.157 J**	0.982 U	0.186 U	**0.297 J**	0.203 U	**1.53 J**	**0.389 J**
1,2,3,4,7,8-HxCDF	0.372 U	**3.34 J**	**1.17 J**	**6.12**	0.113 U	**3.77 J**	**0.812 J**
1,2,3,6,7,8-HxCDF	0.137 U	**1.48 J**	0.335 U	**1.81 J**	0.0781 U	**1.68 J**	**0.348 J**
1,2,3,7,8,9-HxCDD	0.349 U	**3.9 J**	**0.817 J**	**0.701 J**	0.341 U	**3.62 J**	**1.12 J**
1,2,3,7,8,9-HxCDF	0.0882 U	0.0929 U	0.122 U	0.107 U	0.0986 U	0.229 U	0.0548 U
1,2,3,7,8-PeCDD	0.118 U	**0.682 J**	0.18 U	**0.524 J**	0.116 U	**0.822 J**	**0.198 J**
1,2,3,7,8-PeCDF	0.0883 U	**1.25 J**	**0.816 J**	**5.47 J**	0.0867 U	**1.6 J**	**0.19 J**
2,3,4,6,7,8-HxCDF	0.243 U	**2.05 J**	**0.219 J**	**0.593 J**	0.0764 U	**2.02 J**	**0.59 J**
2,3,4,7,8-PeCDF	0.0845 U	**1.18 J**	**0.526 J**	**3.73 J**	0.094 U	**1.53 J**	**0.264 J**
2,3,7,8-TCDD	**0.434 J**	**4.35**	**6.97**	**46.5**	**0.547 J**	**10**	0.101 U
2,3,7,8-TCDF	**1.31**	**17.7**	**28.1**	**161**	**1.74**	**41.4**	**0.581 J**
OCDD	**230**	**3050**	**518**	**1190**	**484**	**3700**	**1140**
OCDF	**29.2**	**81.6**	**6.39 J**	**13**	**2.83 J**	**164**	**18.9**

Table 2
Analytical Results for Soil Samples

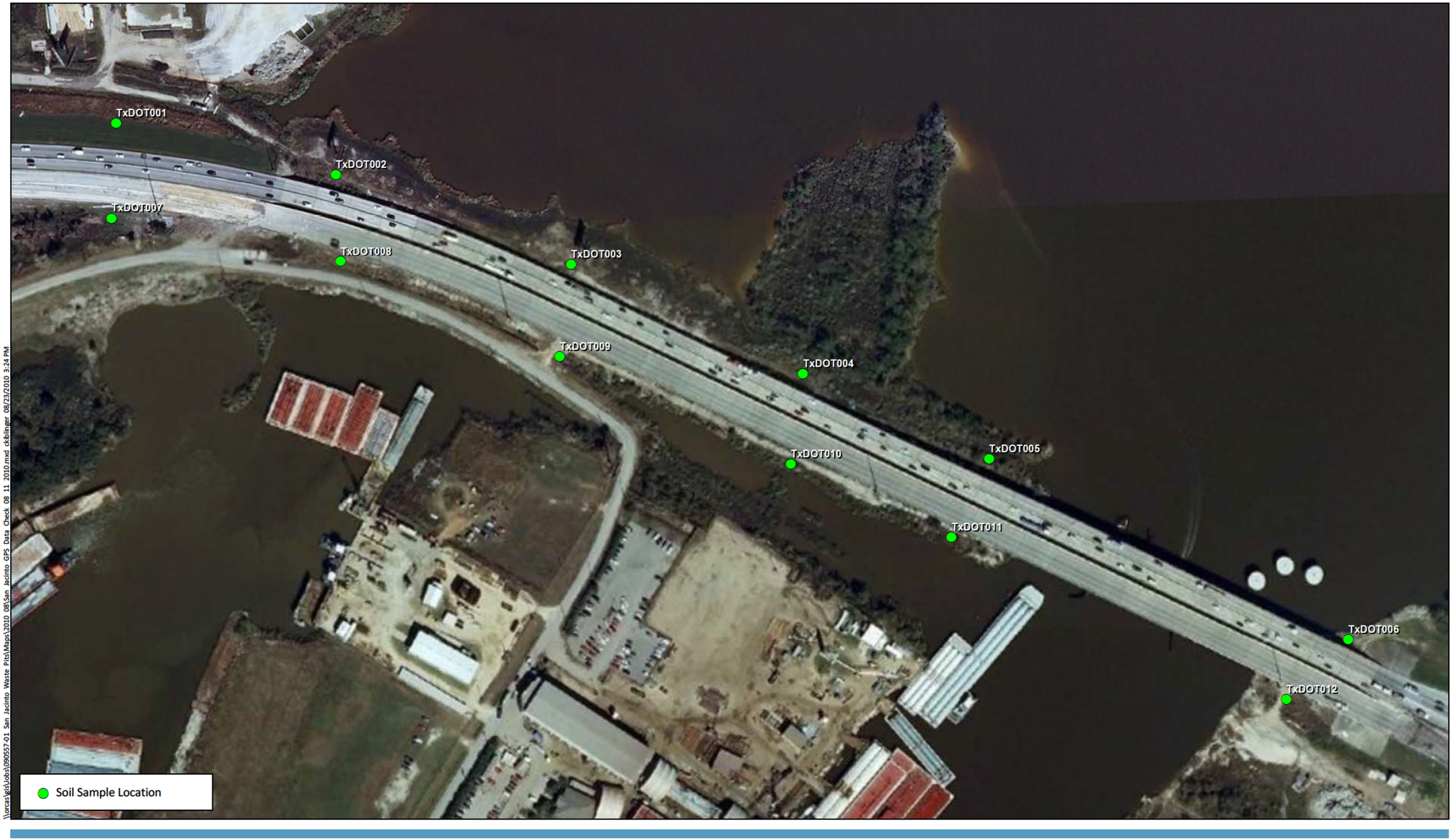
Task:	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010
Location ID:	TxDOT007	TxDOT008	TxDOT009	TxDOT010	TxDOT011	TxDOT012	TxDOT012
Sample Date:	8/12/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010
Upper Depth (cm)	0	0	0	0	0	0	121.92
Lower Depth (cm)	30.48	30.48	30.48	15.24	20.32	30.48	152.4
Conventional Parameters							
Percent Solids (%)	86	96.8	71.4	94	91.8	85.7	85.8
Metals (mg/kg)							
Aluminum	7400	1400	4120	4910	6150	7120	4710
Arsenic	2.12	1.36	2.65	3.13	3.9	1.62	2.9
Barium	134	49.1	123	120	136	26.6	64
Cadmium	0.34 J	0.12 J	0.13 J	0.38 J	0.3 J	0.05 U	0.05 U
Chromium	10.4	4.6	14.8	16.3	14.8	6.2	3.8
Cobalt	3.9	1.8 J	3.2	3.3	4	3.5	3.7
Copper	11.7	8.2	17.3	20.4	39.5	6.2	3.8
Lead	162	35	44	166	75	10 J	9.5 J
Magnesium	1160 J	656 J	1780 J	2990 J	2050 J	1820 J	1500 J
Manganese	346	108	321	245	229	113	182
Mercury	0.019 J	0.007 J	0.022	0.048	0.029	0.004 J	0.008 J
Nickel	6.89	2.51 J	6.56	7.65	8.01	6.64	4.52 J
Thallium	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.5 U
Vanadium	20.2	5.8	12.8	19	21.2	13.9	12.3
Zinc	113	40.3	106	170	149	15.7	7.9
Semivolatile Organic Compounds (µg/							
1,2,4-Trichlorobenzene	0.28 U	0.24 U	0.31 U	0.25 U	0.26 U	0.27 U	0.26 U
1,2-Dichlorobenzene	0.26 U	0.23 U	0.3 U	0.24 U	0.25 U	0.26 U	0.25 U
1,3-Dichlorobenzene	0.29 U	0.25 U	0.33 U	0.26 U	0.27 U	0.28 U	0.28 U
1,4-Dichlorobenzene	0.3 U	0.26 U	0.34 U	0.27 U	0.28 U	0.29 U	0.29 U
2,3,4,6-Tetrachlorophenol	46 U	46 U	49 U	46 U	46 U	46 U	46 U
2,4,5-Trichlorobenzene	18 U	18 U	18 U	18 U	18 U	18 U	18 U
2,4,6-Trichlorophenol	15 U	15 U	16 U	15 U	15 U	15 U	15 U
2,4-Dichlorophenol	17 U	17 U	18 U	17 U	17 U	17 U	17 U
Acenaphthene	14 U	14 U	15 U	18 J	220 J	14 U	14 U
Bis(2-ethylhexyl) phthalate	64 J	53 J	120 J	140 J	80 J	20 J	19 U
Fluorene	13 U	13 U	20 J	13 U	120 J	13 U	13 U
Hexachlorobenzene	15 U	15 U	16 U	15 U	15 U	15 U	15 U
Naphthalene	15 U	15 U	16 U	15 U	110 J	15 U	15 U
Pentachlorophenol	130 U	130 U	140 U	130 U	130 U	130 U	130 U
Phenanthrene	35 J	15 J	180 J	150 J	1000	10 U	10 U
Phenol	20 U	20 U	21 U	20 U	20 U	20 U	20 U
Volatile Organic Compounds (µg/kg)							
1,2,3-Trichlorobenzene	0.25 U	0.22 U	0.29 U	0.23 U	0.24 U	0.25 U	0.24 U
Chloroform	0.26 U	0.23 U	0.3 U	0.24 U	0.25 U	0.26 U	0.25 U
Pesticides (µg/kg)							
Carbazole	12 U	12 U	23 J	26 J	210 J	12 U	12 U

Table 2
Analytical Results for Soil Samples

Task:	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010	TxDOT_ROW_2010
Location ID:	TxDOT007	TxDOT008	TxDOT009	TxDOT010	TxDOT011	TxDOT012	TxDOT012
Sample Date:	8/12/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010	8/12/2010
Upper Depth (cm)	0	0	0	0	0	0	121.92
Lower Depth (cm)	30.48	30.48	30.48	15.24	20.32	30.48	152.4
PCBs							
Aroclor 1016 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1221 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1232 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1242 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1248 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1254 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1260 (µg/kg)	19 U	19 U	19 U	**32 J**	**24 J**	19 U	19 U
Aroclor 1262 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
Aroclor 1268 (µg/kg)	19 U	19 U	19 U	19 U	19 U	19 U	19 U
PCB077 (ng/kg)	**40.3 J**	**12.5 J**	**36.4 J**	**37.5 J**	**45.7 J**	0.993 U	1.26 U
PCB081 (ng/kg)	1.33 U	1.23 U	**1.22 J**	1.59 U	1.77 U	0.932 U	1.16 U
PCB105 (ng/kg)	**281**	**64.6 J**	**486**	**299**	**582**	3.67 U	3.35 U
PCB114 (ng/kg)	**17.1 J**	**3.61 J**	**30.4 J**	**14.7 J**	9.77 U	0.729 U	0.888 U
PCB118 (ng/kg)	**559 J**	**114 J**	**1160**	**580**	**973**	8.3 U	10.1 U
PCB123 (ng/kg)	12.1 U	**3.41 J**	21.3 U	**14 J**	**22.2 J**	0.749 U	0.864 U
PCB126 (ng/kg)	**19.2 J**	**2.26 J**	6.35 U	**8.96 J**	9.77 U	0.742 U	0.838 U
PCB156/157 (ng/kg)	**419 J**	**64.9 J**	**375 J**	**323 J**	**288 J**	1.86 U	1.97 U
PCB167 (ng/kg)	**161 J**	**26.7 J**	**127 J**	**120 J**	**101 J**	0.767 U	0.708 U
PCB169 (ng/kg)	**8.76 J**	1.28 U	2.06 U	**5.27 J**	1.19 U	0.857 U	0.76 U
PCB189 (ng/kg)	**91.6 J**	**15.3 J**	**30.5 J**	**55.7 J**	**38.4 J**	1.06 U	0.808 U
Dioxins/Furans (ng/kg)							
1,2,3,4,6,7,8-HpCDD	**319**	**93**	**60.2**	**217**	**123**	**5.28 J**	**6.82**
1,2,3,4,6,7,8-HpCDF	**61.1**	**12.8**	**9.88**	**39.4**	**14.4**	0.0261 U	0.0217 U
1,2,3,4,7,8,9-HpCDF	**4.22 J**	**0.671 J**	**0.861 J**	**4.29 J**	**1.08 J**	0.0321 U	0.0268 U
1,2,3,4,7,8-HxCDD	**1.26 J**	0.429 U	**0.531 J**	**1.65 J**	**1.08 J**	**0.103 J**	**0.198 J**
1,2,3,4,7,8-HxCDF	**4.96 J**	**0.677 J**	**1.39 J**	**3.9 J**	**2.09 J**	0.0114 U	0.00979 U
1,2,3,6,7,8-HxCDF	**1.5 J**	0.338 U	**0.673 J**	**1.82 J**	**0.972 J**	0.0111 U	0.029 U
1,2,3,7,8,9-HxCDD	**3 J**	**1.24 J**	**1.71 J**	**5.47**	**3.51 J**	**0.221 J**	**0.387 J**
1,2,3,7,8,9-HxCDF	0.207 U	0.134 U	0.235 U	0.0823 U	0.0667 U	0.0114 U	0.00979 U
1,2,3,7,8-PeCDD	0.372 U	**0.202 J**	0.238 U	**1.03 J**	**0.573 J**	0.0174 U	**0.152 J**
1,2,3,7,8-PeCDF	**0.247 J**	0.0962 U	0.273 U	**1.29 J**	**0.696 J**	0.0131 U	0.0261 U
2,3,4,6,7,8-HxCDF	**2.94 J**	**0.844 J**	**0.784 J**	**1.75 J**	**1.01 J**	0.0114 U	0.00953 U
2,3,4,7,8-PeCDF	**0.659 J**	0.149 U	0.339 U	**1.49 J**	**0.83 J**	0.0124 U	0.0249 U
2,3,7,8-TCDD	0.39 U	0.153 U	**0.55 J**	**5.37**	**2.2**	0.0646 U	0.122 U
2,3,7,8-TCDF	0.775 U	**0.813 J**	**2.49**	**22.8**	**8.73**	0.0212 U	0.0225 U
OCDD	**3840**	**1700**	**1640**	**6870**	**3410**	**229**	**247**
OCDF	**347**	**54.3**	**43.1**	**210**	**58.6**	**0.177 U**	0.0355 U

Notes:
U - Indicates the compound or analyte was analyzed for but not detected at or above the specified limit.
J - Result is less than the method reporting limit but greater than or equal to the method detection limit and the concentration is an estimated value.

FIGURES



ANCHOR QEA

Feet
0 100 200 300 400

Figure #
GPS Data Check
San Jacinto Waste Pits

APPENDIX A
FIELD DOCUMENTATION

Daily Log

ANCHOR QEA

Anchor QEA, LLC
6120 Dairy Ashford Rd.
Houston, TX 77072
Phone 281.979.7338

PROJECT NAME: SJRWP **DATE:** 8-11-2010 1 of 3

SITE ADDRESS: n/a **PERSONNEL:** R. Brown

WEATHER: **WIND FROM:** ~~N~~ ~~NE~~ E ~~SE~~ S ~~SW~~ W ~~NW~~ (SUNNY) CLOUDY RAIN ?

(LIGHT) MEDIUM HEAVY

TEMPERATURE: (°F) 100 . °C [Circle appropriate units]

TIME	COMMENTS
0750	R. Brown onsite. Rod Kimbro (TxDOT) onsite.
0800	Fugro Consultants (Doug, Orin) onsite.
0805	Second TxDOT gate outside SJRWP gate locked w/ combination lock; call V Marsh, L. Polk (TxDOT) to try to get combination
0810	Conduct tailgate H&S meeting - See Daily Safety Briefing form
0830	Receive combination to gate from V. Marsh: 7303
0830	Mobilize to TxDOT 005 location near old boat slip
0845	At TxDOT 005; there is a 3' metal stake at shoreline denoting a gas pipeline, directly east of TxDOT 005 location. There are no accompanying utility flags in the area.
0845	R. Brown call K. Parton (Fugro) to see if utilities were cleared per the One Call ticket that K. Parton submitted. K. Parton states that he received phone calls and emails stating that the proposed locations TxDOT 004, 005, 012 are clear. However, all parties currently onsite (Doug, Rod Kimbro, Randy Brown) are skeptical that utilities are in fact clear at TxDOT 005 location.
0915	Doug tests ground at several locations in a 25' radius around TxDOT 005 location with metal probe rod; he is unable to probe past 1-to-3 feet deep before hitting refusal. Refusal is likely due to concrete rubble in the area around the old boat slip based on visual observation of surface and Doug's opinion.
0940	R. Brown and Doug decide not to use geoprobe to collect samples to 5' bgs due to absence of utility mark-outs on the TxDOT ROW. All sample locations will be advanced using hand auger.
1000	R. Brown call K. Parton to ask if it would be possible to get an on-site meeting w/ utility markers. K. Parton will try, but said that it will be difficult to get utility locators to meet. He will check on private utility locating.

Signature: Randy R B

Daily Log

ANCHOR QEA

Anchor QEA, LLC
6120 Dairy Ashford Rd.
Houston, TX 77072
Phone 281.979.7338

PROJECT NAME: SJRWP **DATE:** 8-11-2010 2 of 3

SITE ADDRESS: n/a **PERSONNEL:** R. Brown

WEATHER: **WIND FROM:** N | NE | E | SE | S | SW | W | NW — LIGHT | MEDIUM | HEAVY

SUNNY | CLOUDY | RAIN | ? **TEMPERATURE:** °F 100 °C [Circle appropriate units]

TIME	COMMENTS
1045	R. Kinbro (TxDOT) offsite. R. Brown to contact him with updates on progress - all locations will be hand-augered.
1045-1115	Tootie Hoffpair of Stallion Construction onsite to view west cell. Stallion is evaluating potential use of crane mats to get geoted drill rig on west cell (subcontract to Fugro).
1115	Tootie states that he will provide his recommendation to K. Parton. He states crane mats may not be appropriate or cost effective because access road to west cell would get torn up by forklift delivering mats, the mats may need to be overlaid several thick to bridge over the paper sludge, some mats may not be retrievable, and decon would be expensive. T. Hoffpair offsite.
1120	R. Brown contact D. Keith regarding inability to geoprobe due to observation that utilities do not appear to be properly marked D. Keith agrees that hand-augering is appropriate course of action. D. Keith recommends that all 12 locations be hand-augered. Make every effort to collect discrete samples without cross-contamination at depth; if refusal is encountered, note the refusal and note the reason for refusal if observable.
1145	Mobilize to TxDOT 001 location - original coordinates at the top of a 12-15' high embankment within 15-20' of I-10; R. Brown contact D. Keith and recommend moving TxDOT 001 location about 40' north (toward Big Star property) to the bottom of the embankment. D. Keith OK with proposed move.
1245	TxDOT 001 complete Pause sampling to cool off in AC in cars for health & safety purposes.
1245	Doug (Fugro) inform R. Brown that they have a private utility locator coming to site to mark utilities around TxDOT 005.

Signature: Randy R B

Daily Log

ANCHOR QEA

Anchor QEA, LLC
6120 Dairy Ashford Rd.
Houston, TX 77072
Phone 281.979.7338

PROJECT NAME: SJRWP **DATE:** 8-11-2010 3 of 3

SITE ADDRESS: n/a **PERSONNEL:** R. Brown

WEATHER: **WIND FROM:** N | NE | E | SE | S | SW | W | NW

SUNNY | CLOUDY | RAIN | ?

LIGHT | MEDIUM | HEAVY

TEMPERATURE: °F 100 °C [Circle appropriate units]

TIME	COMMENTS
1320	Ray Hall of Houston Underground Utility Locating onsite —
	• Inspect TxDOT 005 area. Identifies 2 gas pipes directly over TxDOT 005 location; R. Brown adjust location 20' NE —
	• Ray cannot guarantee that other pipes (fiber optic, etc.) are not in the area. Doug and R. Brown agree that hand-augering TxDOT 005 is the safe and appropriate alternative.
	• Ray inspect TxDOT 004 area; no pipes identified, but again Ray cannot guarantee clearance - will hand auger TxDOT 004 also.
	• Because Fugro will hand auger TxDOT 012 anyway, Doug directs Ray not to bother inspecting TxDOT 012 location. —
1400	Ray Hall offsite. Doug offsite to obtain payment for Ray. —
1405	R. Brown, Orin mobilize to TxDOT 002. —
1500	TxDOT 002 complete; mobilize to TxDOT 003. —
1545	TxDOT 003 complete; gather equipment to leave site for day.
1605	R. Brown, Fugro offsite.

Signature: Randy R B

Daily Log

ANCHOR QEA

Anchor QEA, LLC
6120 Dairy Ashford Rd.
Houston, TX 77072
Phone 281.979.7338

PROJECT NAME: STRWP **DATE:** 8-12-2010 1 of 2

SITE ADDRESS: n/a **PERSONNEL:** R. Brown

WEATHER: **WIND FROM:** N | NE | E | SE | S | SW | W | NW | ? (circled: E, SE)

SUNNY | CLOUDY (circled) | RAIN

(LIGHT) | MEDIUM | HEAVY

TEMPERATURE: °F 95 . °C [Circle appropriate units]

TIME	COMMENTS
0710	R. Brown onsite. Fugro (Doug, Orin) onsite.
0710	weather is overcast; 50% chance of T-storms per weather rpt.
0715	Conduct tailgate H&S meeting - See Daily Safety Briefing form.
0730	Mobilize to TxDOT 007 location.
0815	TxDOT 007 complete; mobilize to TxDOT 008.
0820	TxDOT 008 on old concrete access road - move approx. 12' south to a grassy location adjacent to the road.
0840	TxDOT 008 contains sand w/ gravel. Doug is concerned that Fugro's 2 augers will break in the sand and gravel. Doug offsite to obtain new hand augers.
0900	TxDOT 008 Complete. R. Brown, Orin take AC break to cool off.
0920	Mobilize to TxDOT 009.
0925	Carl (USA Environment) onsite. He was asked by Red Kimbro (TxDOT) to view the TxDOT ROW and prepare a proposal to clean up debris along the ROW.
1015	TxDOT 009 complete.
1015	Carl (USA Environment offsite.
1020	Doug (Fugro) returns to site with new hand auger.
1045	At TxDOT 010 location, begin sample collection.
1120	TxDOT 010 complete, mobilize to TxDOT 004 location.
1145	1st attempt at TxDOT 004 meets refusal @ 2.5' bgs - hollow sound when tapping auger on bottom of hole - possible buried pipe.
1155	2nd attempt at TxDOT 004 meets refusal at 4.7' bgs - a little bit of tan sand is observed on tip of auger after retrieval - possible pipe bedding. Will terminate TxDOT 004 at 4.7' bgs and collect sample from 4 - 4.7'.
1200	TxDOT 004 complete. Return to vehicles for AC/break.
1230	Mobilize to TxDOT 005.

Signature: Randy R B

Daily Log

ANCHOR QEA

Anchor QEA, LLC
6120 Dairy Ashford Rd.
Houston, TX 77072
Phone 281.979.7338

PROJECT NAME: SJRUP **DATE:** 8-12-2010 2 of 2

SITE ADDRESS: n/a **PERSONNEL:** R. Brown

WEATHER: **WIND FROM:** N | NE | E | SE | S | SW | W | NW

SUNNY | CLOUDY | RAIN | ?

LIGHT | MEDIUM | HEAVY

TEMPERATURE: °F 95 °C [Circle appropriate units]

TIME	COMMENTS
1340	Several attempts at TxDOT005 all end in refusal between 3 and 18 inches - concrete rubble is suspected cause.
1350	Mobilize to TxDOT 011.
1415	Several attempts at TxDOT 011 all meet refusal at 8 inch. Concrete rubble or concrete slab in area near shore. Collect TxDOT 011 sample from 0-8 inches.
1430	Reconvene at vehicles and travel to east side of river.
1500	At TxDOT 012 location. Original coordinates are in a concrete-lined drainage ditch; move location approx. 30'NE, to approx. 15' SE of light pole near river's edge.
1515	Refusal at 1st attempt; move TxDOT 012 approx. 40-50' to west.
1550	2nd attempt at TxDOT 012 complete to 5' bgs.
1600	Mobilize to TxDOT006
1640	Entire area around TxDOT006 is concrete rubble fill based on visual appearance of surface within at least 100 feet of TxDOT006. Make 3 attempts w/ hand auger at TxDOT006, meet refusal at 6 inches each time. Collect TxDOT006 sample from 0-6 inches.
1650	Final decon.
1700	Fugro Consultants (Doug, Orin) offsite.
1700	R. Brown collect wipe samples.
1730	R. Brown offsite.

Signature: Randy R B

Daily Log

ANCHOR QEA

Anchor QEA, LLC
6120 Dairy Ashford Rd.
Houston, TX 77072
Phone 281.979.7338

PROJECT NAME: STRWP **DATE:** 8-13-2010 1 of 1

SITE ADDRESS: n/a **PERSONNEL:** R. Brown

WEATHER: **WIND FROM:** N | NE | E | SE | S | SW | W | NW

(SUNNY) | CLOUDY | RAIN | ?

LIGHT | MEDIUM | HEAVY

TEMPERATURE: (°F) 95 . °C [Circle appropriate units]

TIME	COMMENTS
1630	R. Brown onsite to meet Veolia for pick up of investigation-derived waste.
1630	Veolia onsite. Drive into site to pick up 2 5-gallon pails w/ waste - soil, decon water, and disposable sampling equipment (gloves, plastic sheeting, etc.)
1650	R. Brown, Veolia offsite.

Signature: Randy R Brown

Could look TBD

ANCHOR QEA

DATE: 8-11-2010

PROJECT NAME: San Jacinto River Waste Pits

PROJECT NO: 090557.01-01

DAILY SAFETY BRIEFING

PERSON CONDUCTING MEETING: R. Brown

HEALTH & SAFETY OFFICER: J. Kase

PROJECT MANAGER: D. Keith

TOPICS COVERED:

- [x] Emergency Procedures and Evacuation Route
- [x] Directions to Hospital
- [x] HASP Review and Location
- [ ] Safety Equipment Location
- [ ] Proper Safety Equipment Use
- [ ] Employee Right-to-Know/MSDS Location
- [ ] Fire Extinguisher Location
- [ ] Eye Wash Station Location
- [ ] Buddy System
- [x] Self and Coworker Monitoring
- [ ] Lines of Authority
- [ ] Communication
- [ ] Site Security
- [ ] Vessel Safety Protocols
- [x] Work Zones
- [ ] Vehicle Safety and Driving/Road Conditions
- [ ] Equipment Safety and Operation
- [x] Proper Use of PPE
- [x] Decontamination Procedures
- [ ] Other:
- [ ] Lifting Techniques
- [ ] Slips, Trips, and Falls
- [ ] Hazard Exposure Routes
- [x] Heat and Cold Stress
- [ ] Overhead and Underfoot Hazards
- [ ] Chemical Hazards
- [ ] Flammable Hazards
- [x] Biological Hazards
- [x] Eating/Drinking/Smoking

WEATHER CONDITIONS:

DAILY WORK SCOPE:

geoprobing and hand augering for TxDOT ROW sample event

SITE-SPECIFIC HAZARDS:

direct contact w/ contaminated soil

utilities (Fugro has called TolineCalls)

SAFETY COMMENTS:

ATTENDEES

PRINTED NAME	SIGNATURE
RANDY BROWN	Randy R B
Douglas Fruehauf	Douglas Fruehauf
Orin Worsham	Orin Worsham
Rob KIMBRO	Rob Kimbro

ANCHOR QEA

DATE: 8-12-2010

PROJECT NAME: SJRWP

PROJECT NO: 060557.01-01

DAILY SAFETY BRIEFING

PERSON CONDUCTING MEETING: R. Brown **HEALTH & SAFETY OFFICER:** J. Kaso **PROJECT MANAGER:** D. Keath

TOPICS COVERED:

- ☐ Emergency Procedures and Evacuation Route
- ☐ Directions to Hospital
- ☑ HASP Review and Location
- ☐ Safety Equipment Location
- ☐ Proper Safety Equipment Use
- ☐ Employee Right-to-Know/MSDS Location
- ☐ Fire Extinguisher Location
- ☐ Eye Wash Station Location
- ☐ Buddy System
- ☐ Self and Coworker Monitoring
- ☐ Lines of Authority
- ☐ Communication
- ☐ Site Security
- ☐ Vessel Safety Protocols
- ☐ Work Zones
- ☐ Vehicle Safety and Driving/Road Conditions
- ☐ Equipment Safety and Operation
- ☐ Proper Use of PPE
- ☐ Decontamination Procedures
- ☐ Other:
- ☑ Lifting Techniques
- ☑ Slips, Trips, and Falls
- ☐ Hazard Exposure Routes
- → ☑ Heat and Cold Stress
- ☐ Overhead and Underfoot Hazards
- ☐ Chemical Hazards
- ☐ Flammable Hazards
- ☐ Biological Hazards
- ☐ Eating/Drinking/Smoking

WEATHER CONDITIONS: Overcast
85°F, expected high 100°F
50% chance of T-storms

DAILY WORK SCOPE:
hand auger / soil sampling

SITE-SPECIFIC HAZARDS:
heat stress

SAFETY COMMENTS:

ATTENDEES

PRINTED NAME	SIGNATURE
Randy Brown	Randy Brown
Douglas Fraukart	Douglas Fraukart
Orin Wareham	Orin Wareham

APPENDIX B
DATA VALIDATION REPORT

EcoChem, INC.
Environmental Data Quality

DATA VALIDATION REPORT

SAN JACINTO RIVER
Texas Department of Transportation Right of Way Soil Sampling

Prepared for:

Integral Consulting, Inc.
1205 West Bay Dr. NW
Olympia, Washington 98502

Prepared by:

EcoChem, Inc.
710 Second Avenue, Suite 660
Seattle, Washington 98104

EcoChem Project: C22130-3

September 24, 2010

Approved for Release

Melissa Swanson
Project Chemist
EcoChem, Inc.

PROJECT NARRATIVE

Basis for Data Validation

This report summarizes the results of the validation (Stage 2A, Stage 2B, and Stage 3/4) performed on sediment and quality control (QC) sample data for the San Jacinto River – Texas Department of Transportation Right of Way Soil Sampling. A complete list of samples is provided in the **Sample Index**. Laboratory batch ID numbers and associated level of validation is provided at the beginning of each technical section

Samples were analyzed by Columbia Analytical Services, Kelso, Washington and Columbia Analytical Services, Houston, Texas. The analytical methods and EcoChem project chemists are listed below:

Analysis	Method of Analysis	Primary Review	Secondary Review
Volatile Organic Compounds	EPA8260B	M. Brindle	M. Swanson
Semivolatile Organic Compounds	SW8270C		
Polychlorinated Biphenyls (Aroclors)	SW8082		
Dioxin & Furan Compounds	EPA 1613B		
Polychlorinated Biphenyls (Congeners)	EPA 1668A		
Metals	ICPAES3050B, ICPMS3050B, SW7470A/7471A	J.Maute	
Total Solids	EPA160.3		

The data were reviewed using guidance and quality control criteria documented in the analytical methods; the *Sampling and Analysis Plan: Sediment Study San Jacinto River Waste Pits Superfund Site* (Integral/AnchorQEA, April 2010); *USEPA National Functional Guidelines for Chlorinated Dioxin/Furan Data Review* (USEPA, September 2005); *National Functional Guidelines for Organic Data Review* (USEPA 1999);.and *USEPA National Functional Guidelines for Inorganic Data Review* (USEPA, October 2004).

EcoChem's goal in assigning data assessment qualifiers is to assist in proper data interpretation. If values are estimated (J or UJ), data may be used for site evaluation and risk assessment purposes but reasons for data qualification should be taken into consideration when interpreting sample concentrations. If values are assigned an R, the data are to be rejected and should not be used for any site evaluation purposes. If values have no data qualifier assigned, then the data meet the data quality objectives as stated in the documents and methods referenced above.

Data qualifier definitions, reason codes, and validation criteria are included as **Appendix A**. The qualified data summary table is included as **Appendix B.** Communication records are included as **Appendix C**. Data Validation Worksheets and the associated communication records will be kept on file at EcoChem, Inc. A qualified laboratory electronic data deliverable (EDD) was also submitted with this report.

Sample Index
San Jacinto Texas DOT Right of Way Soil Sampling

Sample ID	Kelso Lab ID	Houston Lab ID	SVOC	VOC	PCB Aroclors	Dioxins	PCB Congeners	Metals	Total Solids
TxDOT001-SO-0-12-N	K1008732-001	E1000886-001	✓	✓	✓	✓	✓	✓	✓
TxDOT002-SO-0-12-N	K1008732-002	E1000886-002	✓	✓	✓	✓	✓	✓	✓
TxDOT003-SO-0-12-N	K1008732-003	E1000886-003	✓	✓	✓	✓	✓	✓	✓
TxDOT004-SO-0-12-N	K1008732-004	E1000886-004	✓	✓	✓	✓	✓	✓	✓
TxDOT004-SO-48-60-N	K1008732-005	E1000886-005	✓	✓	✓	✓	✓	✓	✓
TxDOT005-SO-0-12-N	K1008732-006	E1000886-006	✓	✓	✓	✓	✓	✓	✓
TxDOT006-SO-0-6-N	K1008732-007	E1000886-007	✓	✓	✓	✓	✓	✓	✓
TxDOT007-SO-0-12-N	K1008732-008	E1000886-008	✓	✓	✓	✓	✓	✓	✓
TxDOT008-SO-0-12-N	K1008732-009	E1000886-009	✓	✓	✓	✓	✓	✓	✓
TxDOT009-SO-0-12-N	K1008732-010	E1000886-010	✓	✓	✓	✓	✓	✓	✓
TxDOT010-SO-0-12-N	K1008732-011	E1000886-011	✓	✓	✓	✓	✓	✓	✓
TxDOT011-SO-0-8-N	K1008732-012	E1000886-012	✓	✓	✓	✓	✓	✓	✓
TxDOT012-SO-0-12-N	K1008732-013	E1000886-013	✓	✓	✓	✓	✓	✓	✓
TxDOT012-SO-48-60-N	K1008732-014	E1000886-014	✓	✓	✓	✓	✓	✓	✓
TxDOT006-SO-0-6-D	K1008732-015	E1000886-015	✓	✓	✓	✓	✓	✓	✓
SoFW-901A	K1008732-016	E1000886-016	✓			✓		✓	
FB-902	K1008732-017							✓	

DATA VALIDATION REPORT
San Jacinto Texas DOT Right of Way Soil Sampling
Volatile Organic Compounds by Method SW8260B

This report documents the review of analytical data from the analyses of soil samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by Columbia Analytical Services, Inc., Kelso, Washington. Refer to the **Sample Index** for a complete list of samples

SDG	Number of Samples	Validation Level
K1008732	15 Soil	Stage 4

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

II. EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory electronic data deliverable (EDD) were verified by comparison to the hardcopy laboratory data package. No errors were noted.

III. TECHNICAL DATA VALIDATION

The quality control (QC) requirements that were reviewed are listed in the following table.

1	Sample Receipt, Preservation, and Holding Times		Laboratory Control Samples (LCS/LCSD)
	GC/MS Instrument Performance Check	1	Field Replicates
	Initial Calibration (ICAL)		Internal Standards
	Continuing Calibration (CCAL)		Reporting Limits
	Laboratory Blanks		Reported Results
1	Field (Trip) Blanks		Compound Identification (Full validation only)
	Surrogate Compounds	1	Calculation Verification (Full validation only)
	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)		

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that sample shipping coolers should arrive at the laboratory within the advisory temperature range of 2° to 6°C. The laboratory received sample coolers with temperatures less than the lower limit, at -0.3°C and -0.4°C. These outliers did not impact data quality; therefore no qualifiers were assigned.

Field Blanks

No field blanks were submitted with this analytical fraction.

Field Replicates

One set of field replicates, TxDOT006-SO-0-6-N & TxDOT006-SO-0-6-D, was submitted. No target analytes were detected, field precision was acceptable.

Calculation Verification

Calculation verifications were performed for this SDG. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, laboratory control sample/laboratory control sample duplicate (LCS/LCSD) and matrix spike/matrix spike duplicate (MS/MSD) percent recovery (%R) values. Precision was also acceptable as demonstrated by the LCS/LCSD, MS/MSD and field replicate relative percent difference values.

No data were qualified for any reason.

All data, as reported, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto Texas DOT Right of Way Soil Sampling
Semivolatile Organic Compounds by Method SW8270C

This report documents the review of analytical data from the analyses of soil samples and the associated laboratory and field quality control (QC) samples. Samples were analyzed by Columbia Analytical Services, Inc., Kelso, Washington. Refer to the **Sample Index** for a complete list of samples.

SDG	Number of Samples	Validation Level
K1008732	15 Soil	Stage 4
	1 Filter Wipe	Stage 2A

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative**.**

II. EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the hardcopy laboratory data package. No errors were noted.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times		Laboratory Control Samples (LCS/LCSD)
	GC/MS Instrument Performance Check	1	Field Replicates
	Initial Calibration (ICAL)		Internal Standards
	Continuing Calibration (CCAL)		Target Analyte List
2	Laboratory Blanks		Reporting Limits (MDL and MRL)
1	Field Blanks		Compound Identification
	Surrogate Compounds		Reported Results
2	Matrix Spikes/Matrix Spike Duplicates (MS/MSD)	1	Calculation Verification (Full validation only)

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Receipt, Preservation, and Holding Times

The validation guidance documents state that sample shipping coolers should arrive at the laboratory within the advisory temperature range of 2° to 6°C. The laboratory received sample coolers with temperatures less than the lower limit, at -0.3°C and -0.4°C. These outliers did not impact data quality; therefore no qualifiers were assigned.

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). If the result is also less than the reporting limit, then the result is elevated to the reporting limit. No action is taken if the sample result is greater than the action level, or for non-detected results.

Method blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets. Bis (2-ethylhexyl) phthalate was detected in the wipe method blank. This analyte was qualified as not detected (U-7) in Sample SOFW-901A.

Field Blanks

Laboratory blanks are used to evaluate all associated field blanks. The field blank for this project is a filter wipe, Sample SOFW-901A. To evaluate the effect on the sample data, action levels of five times (5x) the blank concentrations were established. Positive results remained for carbazole, naphthalene, and phenanthrene in Sample SOFW-901A after qualifiers based on method blank contamination were issued. No field sample results were qualified based on filter wipe blank contamination; these associated results were either not detected or detected at levels greater than the action level.

Matrix Spike/Matrix Spike Duplicates

The matrix spike/matrix spike duplicate (MS/MSD) analysis was performed using Sample TxDOT011-SO-0-8-N. The relative percent difference (RPD) value for bis(2-ethylhexyl)phthalate was greater than the control limit and the MS percent recovery (%R) value was greater than the control limit. The result for this analyte was estimated (J-8,9) in the parent sample.

Field Replicates

One set of field replicates, TxDOT006-SO-0-6-N & TxDOT006-SO-0-6-D, was submitted. All field precision criteria were met. The RPD values were less than 50% for results greater than 5x the reporting limit (RL). Or the absolute difference between the sample and replicate was less than 2x the RL for results less than 5x the RL.

Calculation Verification

Calculation verifications were performed for this SDG. No calculation or transcription errors were found.

OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, MS/MSD, and LCS/LCSD %R values, with the exceptions noted above. Precision was also acceptable as demonstrated by the MS/MSD, LCS/LCSD, and field replicate RPD values, with the exceptions noted above.

On data point was qualified as not detected based on method blank contamination. One data point was estimated due to MS/MSD %R and RPD outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto Texas DOT Right of Way Soil Sampling
PCB Aroclors by Method SW8082

This report documents the review of analytical data from the analyses of soil samples and the associated laboratory quality control (QC) samples. Samples were analyzed by Columbia Analytical Services, Kelso, Washington. Refer to the **Sample Index** for a complete list of samples.

SDG	Number of Samples	Validation Level
K1008732	15 Soil	Stage 4

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

II. EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the hardcopy laboratory data package. No errors were noted.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed in the following table

1	Sample Receipt, Preservation, and Holding Times		Matrix Spikes/Matrix Spike Duplicate (MS/MSD)
	Initial Calibration (ICAL)	1	Field Replicates
	Continuing Calibration (CCAL)		Reporting Limits
	Laboratory Blanks	1	Compound Identification
1	Field Blanks		Reported Results
	Surrogate Compounds	1	Calculation Verification (Full Validation only)
	Laboratory Control Samples (LCS/LCSD)		

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Receipt, Preservation, and Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of 2° to 6°C. The laboratory received sample coolers with temperatures less than the lower limit, at -0.3°C and -0.4°C. These outliers did not impact data quality; therefore no qualifiers were assigned.

Field Blanks

No field blanks were submitted with this analytical fraction.

Field Replicates

One set of field replicates, TxDOT006-SO-0-6-N & TxDOT006-SO-0-6-D, was submitted. No target analytes were detected, field precision was acceptable.

Compound identification

The reported compound identifications were verified by using the quantitation reports (comparing the reported concentrations for each congener used for Aroclor identification), and also by comparing the patterns in the sample chromatogram to the patterns in the standard chromatogram. All compound identifications were acceptable.

Calculation Verification

Calculation verifications were performed for this SDG. No calculation or transcription errors were found.

IV. OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by the surrogate, matrix spike/matrix spike duplicate (MS/MSD), and laboratory control sample (LCS) percent recovery (%R) values. Precision was also acceptable as demonstrated by the MS/MSD and field replicate relative percent difference (RPD) values.

No data were qualified for any reason.

All data, as reported, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto Texas DOT Right of Way Soil Sampling
Dioxin/Furan Compounds by EPA 1613B

This report documents the review of analytical data from the analyses of soil samples and the associated laboratory quality control (QC) samples. Columbia Analytical Services, Houston, Texas, analyzed the samples. Refer to the **Sample Index** for a complete list of samples.

SDG	Number of Samples	Validation Level
E1000886	15 Soil	EPA Stage 4
	1 Filter Wipe	EPA Stage 2A

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

II. EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the hardcopy laboratory data package. No errors were noted.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed in the following table.

	Sample Receipt, Preservation, and Holding Times	1	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
	GC/MS Instrument Performance Check	1	Laboratory Control Samples (LCS/LCSD)
	Initial Calibration (ICAL)		Reference Material (RM)
	Calibration Verification (CVER)	1	Field Replicates
	Isomer Specificity		Target Analyte List
2	Laboratory Blanks	2	Reported Results
1	Field Blanks	2	Compound Identification
1	Labeled Compound Recovery	1	Calculation Verification (EPA Stage 4 only)

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is

reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). If the result is also less than the reporting limit, then the result is elevated to the reporting limit. No action is taken if the sample result is greater than the action level, or for non-detected results.

Method blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets. Various target analytes were detected in the method blanks, however only the result for 1,2,3,4,6,7,8-HpCDF in Sample TxDOT004-SO-48-60-N and the result for OCDD in Sample SoFW-901A were qualified as not detected (U-7).

Field Blanks

One filter wipe blank, SOFW-901A, was submitted with this SDG. No target analytes were detected in this blank after qualifiers based on method blank contamination were issued.

Labeled Compound Recovery

The percent recovery (%R) value for 13C-1,2,3,4,6,7,8-HpCDF (at 26%) was less than the lower control limit in Sample TxDOT010-SO-0-12-N (5x dilution). Only OCDD was reported from this dilution; no qualifiers were required.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate (MS/MSD) samples were not analyzed. Accuracy and precision were evaluated using the laboratory control sample/laboratory control sample duplicate (LCS/LCSD).

Laboratory Control Samples

The LCS %R value for 1,2,3,7,8,9-HxCDF was less than the lower control limit in extraction batch 117375. The LCSD %R value was within control limits; no qualifiers were applied for this single outlier.

Field Replicates

One set of field replicates, TxDOT006-SO-0-6-N & TxDOT006-SO-0-6-D, was submitted. All field precision criteria were met. The relative percent difference (RPD) values were less than 50% for results greater than 5x the reporting limit (RL). Or the absolute difference between the sample and replicate was less than 2x the RL for results less than 5x the RL.

Reported Results

The result for OCDD exceeded the calibrated range in Sample TxDOT010-SO-0-12-N and was "E" flagged by the laboratory. This sample was diluted (5x) and re-analyzed. The OCDD result from the original analyses was qualified as do-not-report (DNR-20) and was reported from the diluted analysis. All other results in the diluted analysis were qualified (DNR-11) and the original results were reported.

Compound Identification

The laboratory assigned K-flags to results when a peak was detected but did not meet ion ratio quantitation criteria. The reported values cannot be considered as positive identification for these analytes. These results were considered potential false positives or estimated maximum possible concentrations (EMPC) and were qualified as not detected (U-22) at the reported values. Laboratory blank values flagged "K" were considered as non-detects.

All positive results for 2,3,7,8-TCDF were confirmed on a DB-225 column as required by the method. The 2,3,7,8-TCDF results from the DB-5 column were qualified do-not-report (DNR-11) in favor of the results from the DB-225 column.

For Sample TxDOT011-SO-0-8-N, the laboratory assigned a P-flag to the 1,2,3,7,8-PeCDF result to indicate the presence of chlorodiphenyl ether interference. The result for this analyte was estimated (J-14).

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

IV. OVERALL ASSESSMENT

As determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by labeled compound and LCS/LCSD %R values, with the exceptions noted above. Precision was also acceptable as demonstrated by the LCS/LCSD and field replicate RPD values.

Data were qualified as not detected due to laboratory blank contamination and ion ratio criteria outliers. One data point was estimated due to chlorodiphenyl ether interference.

Data were flagged as do-not-report (DNR) due to linear calibration range outliers and to indicate which result (from multiple reported analyses) should not be used. Data that has been flagged DNR should not be used for any purpose.

All other data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto Texas DOT Right of Way Soil Sampling
PCB Congeners by EPA 1668A

This report documents the review of analytical data from the analyses of soil samples and the associated laboratory quality control (QC) samples. Columbia Analytical Services, Houston, Texas, analyzed the samples. Refer to the **Sample Index** for a complete list of samples.

SDG	Number of Samples	Validation Level
E1000886	15 Soil	EPA Stage 4

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

II. EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the hardcopy laboratory data package. No errors were noted.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed in the following table.

	Sample Receipt, Preservation, and Holding Times	1	Matrix Spike/Matrix Spike Duplicate (MS/MSD)
	GC/MS Instrument Performance Check		Laboratory Control Samples (LCS/LCSD)
	Initial Calibration (ICAL)		Reference Material (RM)
	Calibration Verification (CVER)	1	Field Replicates
	Isomer Specificity		Target Analyte List
2	Laboratory Blanks		Reported Results
1	Field Blanks	2	Compound Identification
	Labeled Compound Recovery	1	Calculation Verification (EPA Stage 4 only)

[1] ***Quality control results are discussed below, but no data were qualified.***
[2] ***Quality control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Laboratory Blanks

To assess the impact of any blank contaminant on the reported sample results, an action level is established at five times (5x) the concentration reported in the blank. If a contaminant is reported in an associated field sample and the concentration is less than the action level, the result is qualified as not detected (U-7). If the result is also less than the reporting limit, then the result is elevated to the reporting limit. No action is taken if the sample result is greater than the

action level, or for non-detected results.

Method blanks were analyzed at the appropriate frequency. Contaminant levels, associated samples, and action levels are documented in the data validation worksheets. Various target analytes were detected in the method blanks, however only results for PCB105 and PCB118 in Samples TxDOT012-SO-0-12-N and TxDOT012-SO-48-60-N were qualified as not detected (U-7).

Field Blanks

No field blanks were submitted with this analytical fraction.

Matrix Spike/Matrix Spike Duplicate

Matrix spike/matrix spike duplicate (MS/MSD) samples were not analyzed. Accuracy and precision were evaluated using the laboratory control sample/laboratory control sample duplicate (LCS/LCSD).

Field Replicates

One set of field replicates, TxDOT006-SO-0-6-N & TxDOT006-SO-0-6-D, was submitted. All field precision criteria were met. The relative percent difference (RPD) values were less than 50% for results greater than 5x the reporting limit (RL). Or the absolute difference between the sample and replicate was less than 2x the RL for results less than 5x the RL.

Compound Identification

The laboratory assigned K-flags to results when a peak was detected but did not meet ion ratio quantitation criteria. The reported values cannot be considered as positive identification for these analytes. These results were considered potential false positives or estimated maximum possible concentrations (EMPC) and were qualified as not detected (U-22) at the reported values. Laboratory blank values flagged “K” were considered as non-detects.

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical method. Accuracy was acceptable, as demonstrated by labeled compound and LCS/LCSD %R values. Precision was also acceptable as demonstrated by the LCS/LCSD and field replicate RPD values.

Data were qualified as not detected due to method blank contamination and ion ratio criteria outliers.

All data, as qualified, are acceptable for use.

DATA VALIDATION REPORT
San Jacinto Texas DOT Right of Way Soil Sampling
Metals by Methods SW6010B, 6020A, and 7471A
Total Solids by EPA 160.3M

This report documents the review of analytical data from the analyses of soil samples and the associated laboratory quality control (QC) samples. Columbia Analytical Services, Houston, Texas, analyzed the samples. Refer to the **Sample Index** for a complete list of samples.

SDG	Number of Samples	Validation Level
K1008732	15 Soil	Stage 3
	2 Filter Wipes	Stage 2B

I. DATA PACKAGE COMPLETENESS

The laboratory submitted all required deliverables. The laboratory followed adequate corrective action processes and all anomalies were discussed in the case narrative.

I. EDD TO HARDCOPY VERIFICATION

Ten percent (10%) of the results in the laboratory EDD were verified by comparison to the hardcopy laboratory data package. No errors were noted.

III. TECHNICAL DATA VALIDATION

The QC requirements that were reviewed are listed below.

1	Sample Receipt, Preservation, and Holding Times	2	Matrix Spike Samples
	Initial Calibration	1	Laboratory Duplicates
	Continuing Calibration Verification	1	Field Replicates
	CRDL Standards		Interference Check Samples
2	Laboratory Blanks		Serial Dilutions
1	Field Blanks		ICP-MS Internal Standards
	Laboratory Control Samples (LCS/LCSD)		Reporting Limits (MDL and MRL)
1	Reference Materials	1	Calculation Verification (Stage 3 only)

[1] ***Quality control results are discussed below, but no data were qualified***
[2] ***Quality control control outliers that impact the reported data were noted. Data qualifiers were issued as discussed below.***

Sample Preservation and Holding Times

As stated in validation guidance documents, sample shipping coolers should arrive at the laboratory within the advisory temperature range of 2° to 6°C. The laboratory received sample coolers with temperatures less the lower control limit, at -0.3°C and -0.4°C. These outliers did not impact data quality; therefore no qualifiers were assigned.

Laboratory Blanks

To assess the impact of each blank contaminant on the reported sample results, an action level is established at five times the concentration detected in the blank. If a contaminant is detected in an associated field sample and the concentration is less than the action level, the result is qualified U-7 at the reported concentration to indicate an elevation of the reporting limit. No action is taken if the sample result is greater than the action level, or for non-detected results.

Some analytes were found at levels less than the negative MDL in some instrument blanks. Action levels of five times the absolute value of the blank concentrations were established for negative blanks. Results less than the action levels in the associated samples were estimated (J/UJ-7) to indicate a potential low bias.

Various target analytes were detected in the instrument blanks. Aluminum and manganese results were qualified as not detected (U-7) in Sample FB-902. Chromium and barium results were qualified as not detected in Samples SOFW-901A and FB-902 (U-7). Copper was estimated (J/UJ-7) in Samples SOFW-901A and FB-902.

Field Blanks

Laboratory blanks are used to evaluate all associated field blanks. The field blanks for this project were filter wipe samples. To evaluate the effect on the sample data, action levels of five times the blank concentrations were established. Sample FB-902 was a master filter wipe blank; it was used to evaluate the filter wipe blank Sample SOFW-901A. Magnesium, nickel, and zinc were qualified as not detected (U-6) in Sample SOFW-901A. Positive results for aluminum and manganese remained after qualifiers based on FB-902 were issued. Field sample results for aluminum and manganese were greater than the action levels; no additional qualifiers were applied.

Reference Materials

The certified reference material (CRM) ERA lot number D065540 was analyzed with all soil samples. All recoveries were within the certified acceptance ranges.

Matrix Spike

Matrix spike/matrix spike duplicate (MS/MSD) samples were not analyzed for wipe samples. Accuracy and precision were evaluated using the laboratory control sample/laboratory control sample duplicate (LCS/LCSD).

The MS/MSD analysis was performed using Sample TxDOT001-SO-0-12-NS. The percent recovery (%R) value for magnesium was greater than the upper control limit, at 153.4%. Associated magnesium results were estimated (J-8) to indicate a high bias.

Laboratory Duplicates

Laboratory duplicates were not analyzed for wipe samples. Accuracy and precision were evaluated using the LCS/LCSD. For soil samples laboratory duplicate precision was acceptable.

Field Replicates

One set of field replicates, TxDOT006-SO-0-6-N & TxDOT006-SO-0-6-D, was submitted. The relative percent difference (RPD) values were greater than the 50% control limit for barium and cobalt, at 51.8% and 131%, respectively. No data were qualified based on field replicate precision outliers. Data users should consider the impact of field precision outliers on the reported results.

Calculation Verification

Several results were verified by recalculation from the raw data. No calculation or transcription errors were noted.

IV. OVERALL ASSESSMENT

As was determined by this evaluation, the laboratory followed the specified analytical methods. Accuracy was acceptable, as demonstrated by the LCS/LCSD and MS/MSD %R values, with the exceptions noted above. Precision was also acceptable as demonstrated by the MS/MSD, LCS/LCSD, and field replicate RPD values, with the exceptions noted above.

Data were estimated and/or detection limits were elevated based on laboratory blank results. Data were also estimated based on MS %R outliers

All data, as qualified, are acceptable for use.

APPENDIX A

DATA QUALIFIER DEFINITIONS, REASON CODES, AND CRITERIA TABLES

DATA VALIDATION QUALIFIER CODES
Based on National Functional Guidelines

The following definitions provide brief explanations of the qualifiers assigned to results in the data review process.

U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents the approximate concentration.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

The following is an EcoChem qualifier that may also be assigned during the data review process:

DNR	Do not report; a more appropriate result is reported from another analysis or dilution.

DATA QUALIFIER REASON CODES

1	Holding Time/Sample Preservation
2	Chromatographic pattern in sample does not match pattern of calibration standard.
3	Compound Confirmation
4	Tentatively Identified Compound (TIC) (associated with NJ only)
5A	Calibration (initial)
5B	Calibration (continuing)
6	Field Blank Contamination
7	Lab Blank Contamination (e.g., method blank, instrument, etc.)
8	Matrix Spike(MS & MSD) Recoveries
9	Precision (all replicates)
10	Laboratory Control Sample Recoveries
11	A more appropriate result is reported (associated with “R” and “DNR” only)
12	Reference Material
13	Surrogate Spike Recoveries (a.k.a., labeled compounds & recovery standards)
14	Other (define in validation report)
15	GFAA Post Digestion Spike Recoveries
16	ICP Serial Dilution % Difference
17	ICP Interference Check Standard Recovery
18	Trip Blank Contamination
19	Internal Standard Performance (e.g., area, retention time, recovery)
20	Linear Range Exceeded
21	Potential False Positives
22	Elevated Detection Limit Due to Interference (i.e., laboratory, chemical and/or matrix)

EcoChem Validation Guidelines for Volatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C±2°C Water: HCl to pH < 2	J(+)/UJ(-) if greater than 6 deg. C (EcoChem PJ)	1
Hold Time	Waters: 14 days preserved 7 Days: unpreserved (for aromatics) Solids: 14 Days	J(+)/UJ(-) if hold times exceeded If exceeded by > 3X HT: J(+)/R(-) (EcoChem PJ)	1
Tuning	BFB Beginning of each 12 hour period Method acceptance criteria	R(+/-) all analytes in all samples associated with the tune	5A
Initial Calibration (Minimum 5 stds.)	RRF > 0.05	(EcoChem PJ, see TM-06) If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5A
	%RSD < 30%	(EcoChem PJ, see TM-06) J(+) if %RSD > 30%	5A
Continuing Calibration (Prior to each 12 hr. shift)	RRF > 0.05	(EcoChem PJ, see TM-06) If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5B
	%D <25%	(EcoChem PJ, see TM-06) If > +/-90%: J+/R- If -90% to -26%: J+ (high bias) If 26% to 90%: J+/UJ- (low bias)	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL)	7
		U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value)	7
	No TICs present	R(+) TICs using 10X rule	7
Storage Blank	One per SDG <CRQL	U(+) the specific analyte(s) results in all assoc.samples using the 5x or 10x rule	7
Trip Blank	Frequency as per project QAPP	Same as method blank for positive results remaining in trip blank after method blank qualifiers are assigned	18
Field Blanks (if required in QAPP)	No results > CRQL	Apply 5X/10X rule; U(+) < action level	6

EcoChem Validation Guidelines for Volatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One per matrix per batch Use method acceptance criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
MS/MSD (RPD)	One per matrix per batch Use method acceptance criteria	J(+) in parent sample if RPD > CL	9
LCS *low conc. H2O VOA*	One per lab batch Within method control limits	J(+) assoc. cmpd if > UCL J(+)/R(-) assoc. cmpd if < LCL J(+)/R(-) all cmpds if half are < LCL	10
LCS *regular VOA (H2O & solid)*	One per lab batch Lab or method control limits	J(+) if %R > UCL J(+)/UJ(-) if %R <LCL J(+)/R(-) if %R < 10% (EcoChem PJ)	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	Added to all samples Within method control limits	J(+) if %R >UCL J(+)/UJ(-) if %R <LCL but >10% (see PJ[1]) J(+)/R(-) if <10%	13
Internal Standard (IS)	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	J(+) if > 200% J(+)/UJ(-) if < 50% J(+)/R(-) if < 25% RT>30 seconds, narrate and Notify PM	19
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (EcoChem PJ)	9
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NJ the TIC unless: R(+) common laboratory contaminants See Technical Director for ID issues	4
Quantitation/ Identification	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	See Technical Director if outliers	14 21 (false +)

PJ[1] No action if there are 4+ surrogates and only 1 outlier.

EcoChem Validation Guidelines for Semivolatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C ±2°	J(+)/UJ(-) if greater than 6 deg. C (EcoChem PJ)	1
Holding Time	Water: 7 days from collection Soil: 14 days from collection Analysis: 40 days from extraction	Water: J(+)/UJ(-) if ext. > 7 and < 21 days J(+)/R(-) if ext > 21 days (EcoChem PJ) Solids/Wastes: J(+)/UJ(-) if ext. > 14 and < 42 days J(+)/R(-) if ext. > 42 days (EcoChem PJ) J(+)/UJ(-) if analysis >40 days	1
Tuning	DFTPP Beginning of each 12 hour period Method acceptance criteria	R(+/-) all analytes in all samples associated with the tune	5A
Initial Calibration (Minimum 5 stds.)	RRF > 0.05	(EcoChem PJ, see TM-06) If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5A
	%RSD < 30%	(EcoChem PJ, see TM-06) J(+) if %RSD > 30%	5A
Continuing Calibration (Prior to each 12 hr. shift)	RRF > 0.05	(EcoChem PJ, see TM-06) If MDL= reporting limit: J(+)/R(-) if RRF < 0.05 If reporting limit > MDL: note in worksheet if RRF <0.05	5B
	%D <25%	(EcoChem PJ, see TM-06) If > +/-90%: J+/R- If -90% to -26%: J+ (high bias) If 26% to 90%: J+/UJ- (low bias)	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample (+) result is less than CRQL and less than appropriate 5X or 10X rule (raise sample value to CRQL)	7
		U(+) if sample (+) result is greater than or equal to CRQL and less than appropriate 5X and 10X rule (at reported sample value)	7
	No TICs present	R(+) TICs using 10X rule	7
Field Blanks (Not Required)	No results > CRQL	Apply 5X/10X rule; U(+) < action level	6

EcoChem Validation Guidelines for Semivolatile Analysis by GC/MS (Based on Organic NFG 1999)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One per matrix per batch Use method acceptance criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
MS/MSD (RPD)	One per matrix per batch Use method acceptance criteria	J(+) in parent sample if RPD > CL	9
LCS low conc. H2O SVOA	One per lab batch Within method control limits	J(+) assoc. cmpd if > UCL J(+)/R(-) assoc. cmpd if < LCL J(+)/R(-) all cmpds if half are < LCL	10
LCS regular SVOA (H2O & solid)	One per lab batch Lab or method control limits	J(+) if %R > UCL J(+)/UJ(-) if %R <LCL J(+)/R(-) if %R < 10% (EcoChem PJ)	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	Minimum of 3 acid and 3 base/neutral compounds Use method acceptance criteria	Do not qualify if only 1 acid and/or 1 B/N surrogate is out unless <10% J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) if %R < 10%	13
Internal Standards	Added to all samples Acceptable Range: IS area 50% to 200% of CCAL area RT within 30 seconds of CC RT	J(+) if > 200% J(+)/UJ(-) if < 50% J(+)/R(-) if < 25% RT>30 seconds, narrate and Notify PM	19
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (EcoChem PJ)	9
TICs	Major ions (>10%) in reference must be present in sample; intensities agree within 20%; check identification	NJ the TIC unless: R(+) common laboratory contaminants See Technical Director for ID issues	4
Quantitation/ Identification	RRT within 0.06 of standard RRT Ion relative intensity within 20% of standard All ions in std. at > 10% intensity must be present in sample	See Technical Director if outliers	14 21 (false +)

EcoChem Validation Guidelines for Pesticides, PCBs, Herbicides, and Phenol by GC/ECD (Based on Organic NFG 1999 & EPA SW-846 Methods 8081/8082/8041/8151)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature	4°C ±2°	J(+)/UJ(-) if greater than 6 deg. C (EcoChem PJ)	1
Holding Time	Water: 7 days from collection Soil: 14 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext/analyzed > HT J(+)/R(-) if ext/analyzed > 3X HT (EcoChem PJ)	1
Resolution Check	Beginning of ICAL Sequence Within RTW Resolution >90%	Narrate (Use Professional Judgement to qualify)	14
Instrument Performance (Breakdown)	DDT Breakdown: < 20% Endrin Breakdown: <20% Combined Breakdown: <30% Compounds within RTW	J(+) DDT NJ(+) DDD and/or DDE R(-) DDT - If (+) for either DDE or DDD J(+) Endrin NJ(+) EK and/or EA R(-) Endrin - If (+) for either EK or EA	5A
Retention Times	Surrogates: TCX (+/- 0.05); DCB (+/- 0.10) Target compounds: elute before heptachlor epoxide (+/- 0.05) elute after heptachlor epoxide (+/- 0.07)	NJ(+)/R(-) results for analytes with RT shifts For full DV, use PJ based on examination of raw data	5B
Initial Calibration	Pesticides: Low=CRQL, Mid=4X, High=16X Multiresponse - one point Calibration %RSD<20% %RSD<30% for surr; two comp. may exceed if <30% Resolution in Mix A and Mix B >90%	J(+)/UJ(-)	5A
Continuing Calibration	Alternating PEM standard and INDA/INDB standards every 12 hours (each preceeded by an inst. Blank) %D < 25% Resolution >90% in IND mixes; 100% for PEM	J(+)/UJ(-) J(+)R(-) if %D > 90% PJ for resolution	5B
Method Blank	One per matrix per batch No results > CRQL	U(+) if sample result is < CRQL and < 5X rule (raise sample value to CRQL) U(+) if sample result is > or equal to CRQL and < 5X rule (at reported sample value)	7
Instrument Blanks	Analyzed at the beginning of every 12 hour sequence No analyte > 1/2 CRQL	Same as Method Blank	7
Field Blanks	Not addressed by NFG No results > CRQL	Apply 5X rule; U(+) < action level	6

EcoChem Validation Guidelines for Pesticides, PCBs, Herbicides, and Phenol by GC/ECD (Based on Organic NFG 1999 & EPA SW-846 Methods 8081/8082/8041/8151)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
MS/MSD (recovery)	One set per matrix per batch Method Acceptance Criteria	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
MS/MSD (RPD)	One set per matrix per batch Method Acceptance Criteria	J(+) in parent sample if RPD > CL	9
LCS	One per SDG Method Acceptance Criteria	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
LCS/LCSD *(if required)*	One set per matrix and batch of 20 samples RPD < 35%	J(+)/UJ(-) assoc. cmpd. in all samples	9
Surrogates	TCX and DCB added to every sample %R = 30-150%	J(+)/UJ(-) if both %R = 10 - 60% J(+) if both >150% J(+)/R(-) if any %R <10%	13
Quantitation/ Identification	Quantitated using ICAL calibration factor (CF) RPD between columns <40%	J(+) if RPD = 40 - 60% NJ(+) if RPD >60% EcoChem PJ - See TM-08	3
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used to avoid reporting two results for one sample	11
Sample Clean-up	GPC required for soil samples Florisil required for all samples Sulfur is optional Clean-up standard check %R within CLP limits	J(+)/UJ(-) if %R < LCL J(+) if %R > UCL	14
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate (Qualifiy if required by project QAPP)	9

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler/Storage Temperature	Waters/Solids < 4°C Tissues <-10°C	EcoChem PJ, see TM-05	1
Holding Time	Extraction - Water: 30 days from collection *Note:* Under CWA, SDWA, and RCRA the HT for H2O is 7 days* Extraction - Soil: 30 days from collection Analysis: 40 days from extraction	J(+)/UJ(-) if ext > 30 days J(+)/UJ(-) if analysis > 40 Days EcoChem PJ, see TM-05	1
Mass Resolution	>=10,000 resolving power at m/z 304.9824 Exact mass of m/z 380.9760 w/in 5 ppm of theoretical value (380.97410 to 380.97790) . Analyzed prior to ICAL and at the start and end of each 12 hr. shift	R(+/-) if not met	14
Window Defining Mix and Column Performance Mix	Window defining mixture/Isomer specificity std run before ICAL and CCAL Valley < 25% (valley = (x/y)*100%) x = ht. of TCDD y = baseline to bottom of valley For all isomers eluting near 2378-TCDD/TCDF isomers (TCDD only for 8290)	J(+) if valley > 25%	5A (ICAL) 5B (CCAL
Initial Calibration	Minimum of five standards %RSD < 20% for native compounds %RSD <30% for labeled compounds (%RSD <35% for labeled compounds under 1613b)	J(+) natives if %RSD > 20%	5A
	Abs. RT of $^{13}C_{12}$-1234-TCDD >25 min on DB5 >15 min on DB-225	EcoChem PJ, see TM-05	
	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	EcoChem PJ, see TM-05	
	S/N ratio > 10 for all native and labeled compounds in CS1 std.	If <10, elevate Det. Limit or R(-)	

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Continuing Calibration	Analyzed at the start and end of each 12 hour shift. %D+/-20% for native compounds %D +/-30% for labeled compounds (Must meet limits in Table 6, Method 1613B) (If %Ds in the closing CCAL are w/in 25%/35% the avg RF from the two CCAL may be used to calculate samples per Method 8290, Section 8.3.2.4)	Do not qualify labeled compounds. Narrate in report for labeled compound %D outliers. For native compound %D outliers: 8290: J(+)/UJ(-) if %D = 20% - 75% J(+)/R(-) if %D > 75% 1613: J(+)/UJ(-) if %D is outside Table 6 limits J(+)/R(-) if %D is +/- 75% of Table 6 limit	5B
	Abs. RT of $^{13}C_{12}$-1234-TCDD and $^{13}C12$-123789-HxCDD +/- 15 sec of ICAL.	EcoChem PJ, see ICAL section of TM-05	
	RRT of all other compounds must meet Table 2 of 1613B.	EcoChem PJ, see TM-05	
	Ion Abundance ratios within QC limits (Table 8 of method 8290) (Table 9 of method 1613B)	EcoChem PJ, see TM-05	
	S/N ratio > 10	If <10, elevate Det. Limit or R(-)	
Method Blank	One per matrix per batch No positive results	If sample result <5X action level, qualify U at reported value.	7
Field Blanks (Not Required)	No positive results	If sample result <5X action level, qualify U at reported value.	6
LCS / OPR	Concentrations must meet limits in Table 6, Method 1613B or lab limits.	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
MS/MSD (recovery)	May not analyze MS/MSD %R should meet lab limits.	Qualify parent only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
MS/MSD (RPD)	May not analyze MS/MSD RPD < 20%	J(+) in parent sample if RPD > CL	9

EcoChem Validation Guidelines for Dioxin/Furan Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 2, 1996 & EPA SW-846, Methods 1613b and 8290)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Lab Duplicate	RPD <25% if present.	J(+)/UJ(-) if outside limts	9
Labeled Compounds / Internal Standards	*Method 8290:* %R = 40% - 135% in all samples *Method 1613B:* %R must meet limits specified in Table 7, Method 1613	J(+)/UJ(-) if %R = 10% to LCL J(+) if %R > UCL J(+)/R(-) if %R < 10%	13
Quantitation/ Identification	Ions for analyte, IS, and rec. std. must max w/in 2 sec. S/N >2.5 IA ratios meet limits in Table 9 of 1613B or Table 8 of 8290 RRTs w/in limits in Table 2 of 1613B	If RT criteria not met, use PJ (see TM-05) If S/N criteria not met, J(+). if unlabelled ion abundance not met, change to EMPC If labelled ion abundance not met, J(+).	21
EMPC (estimated maximum possible concentration)	If quantitation idenfication criteria are not met, laboratory should report an EMPC value.	If laboratory correctly reported an EMPC value, qualify with U to indicate that the value is a detection limit.	14
Interferences	PCDF interferences from PCDPE	If both detected, change PCDF result to EMPC	14
Second Column Confirmation	All 2378-TCDF hits must be confirmed on a DB-225 (or equiv) column. All QC specs in this table must be met for the confirmation analysis.	Report lower of the two values. If not performed use PJ (see TM-05).	3
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (EcoChem PJ)	9
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used	11

EcoChem Validation Guidelines for PCB Congener Analysis by HRMS (Based on EPA Reg. 10 SOP, Rev. 1, 12/1995 & EPA SW-846, Method 1668)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler/Storage Temperature	Waters/Solids <4°C Tissues <-10°C	EcoChem PJ, see TM-05	1
Holding Time	Samples: Up to one year if stored in the dark & temp as above. Extracts: Up to 1 year if stored at <-10°C and in the dark	J(+)/UJ(-) if HT > 1 year EcoChem PJ, see TM-05	1
Mass Resolution	>=10,000 resolving power at m/z 330.9792 <5 ppm deviation from each m/z listed in Table 7 of method. Analyzed prior to ICAL and at the beginning and end of each 12 hr. shift	R(+/-) if not met	14
Column Resolution 209 Congener Solution	Mix of all 209 PCBs run prior to each ICAL and each 12 hour shift RT of PCB209 must be > 55 min PCB 156 & 157 must coelute w/in 2 sec PCB34 & 23 and PCB187 & 182 must be resolved where ((x/y)*100%) < 40% x = ht. of valley and y = ht of shortest peak	J(+) if valley >40%	5A (ICAL) 5B (CCAL)
Initial Calibration	Minimum of five standards %RSD < 20% for native compounds %RSD < 35% for labeled compounds	J(+) natives if %RSD > 20%	5A
	Ion Abundance ratios within QC limits (Method 1668, Table 8) in CS1 std.	EcoChem PJ, see TM-05	
	S/N ratio > 10 for all native and labeled compounds in CS1 std.	If <10, elevate Det. Limit or R(-)	
Continuing Calibration	Every 12 hours: Concentrations must meet criteria specified in Method 1668, Table 6	J(+)/(UJ(-) natives if %D = 30% - 50% J(+)/R(-) natives if %D > 75%	5B
	Absolute RT of all Labelled Compounds and Window Defining Congeners must be +/- 15 sec of RT in ICAL RRT of all compounds must meet Table 2 of method.	EcoChem PJ, see ICAL section of TM-05	
	S/N ratio > 10	If <10, elevate Det. Limit or R(-)	
	Ion Abundance ratios must meet criteria specified in Method 1668, Table 8	EcoChem PJ, see TM-05	
Method Blank	One per matrix per batch No positive results	If sample result <5X action level, qualify U at reported value.	7

EcoChem Validation Guidelines for PCB Congener Analysis by HRMS
(Based on EPA Reg. 10 SOP, Rev. 1, 12/1995 & EPA SW-846, Method 1668)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Rinse/Field Blank (if required)	One per matrix per batch No positive results	If sample result <5X action level, qualify U at reported value.	6
LCS / OPR	One per matrix per batch %R Values w/in limits specified in Method 1668, Table 6	J(+) if %R > UCL J(+)/UJ(-) if %R < LCL J(+)/R(-) using PJ if %R <<LCL (< 10%)	10
MS/MSD (if required)	Accuracy: %R values within laboratory limits	Qualify parent sample only unless other QC indicates systematic problems: J(+) if both %R > UCL J(+)/UJ(-) if both %R < LCL J(+)/R(-) if both %R < 10% PJ if only one %R outlier	8
	Precision: RPD < 20%	J(+) in parent sample if RPD > 20%	9
Duplicate (if required)	RPD <25%	J(+)/UJ(-) if outside limts	9
Labeled Compounds / Internal Standards	%R must meet limits specified in Method 1668, Table 6.	J(+)/UJ(-) if %R = 10% to LCL J(+) if %R > UCL J(+)/R(-) if %R < 10%	13
Quantitation/ Identification	Ions for analyte, IS, and rec. std. must max w/in 2 sec. S/N >2.5 Ion abundance (IA ratios) must meet limits stated in Table 8 of Method 1668 Relative retention times (RRT) must be w/in limits stated in Table 2 of Method 1668	If RT criteria not met, use PJ (see TM-05) J(+) if S/N criteria not met if unlabelled ion abundance not met, change to EMPC J(+) if labelled ion abundance not met.	21
Interferences	Lock masses must not deviate +/- 20%	Change result to EMPC	14
Field Duplicates	Use QAPP limits. If no QAPP: Solids: RPD <50% OR absolute diff. < 2X RL (for results < 5X RL) Aqueous: RPD <35% OR absolute diff. < 1X RL (for results < 5X RL)	Narrate and qualify if required by project (EcoChem PJ)	9
Two analyses for one sample	Report only one result per analyte	"DNR" results that should not be used to avoid reporting two results for one sample	11

EcoChem Validation Guidelines for Metals Analysis by ICP (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration Tissues: Frozen	EcoChem Professional Judgment - no qualification based on cooler temperature outliers J(+)/UJ(-) if pH preservation requirements are not met	1
Holding Time	180 days from date sampled Frozen tissues - HT extended to 2 years	J(+)/UJ(-) if holding time exceeded	1
Initial Calibration	Blank + minimum 1 standard If more than 1 standard, r > 0.995	J(+)/UJ(-) if r < 0.995 (multi point cal)	5A
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±10% of true value	J(+)/UJ(-) if %R 75-89% J(+) if %R = 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5A
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run %R within ±10% of true value	J(+)/UJ(-) if %R = 75-89% J(+) if %R 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5B

Initial and Continuing Calibration Blank (ICB/CCB)	After each ICV and CCV
	every ten samples and end of run
	| blank | < IDL (MDL)
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		(Refer to TM-02 for additional information)
			7

Reporting Limit Standard	2x RL analyzed beginning of run Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Sb, Pb, Tl)	R(-)/J(+) < 2x RL if %R <50% (< 30% Sb, Pb, Tl) J(+) < 2x RL, UJ(-) if %R 50-69% (30-49% Sb, Pb,Tl) J(+) < 2x RL if %R 130-180% (150-200% Sb, Pb, Tl) R(+) < 2x RL if %R > 180% (200% Sb, Pb, Tl)	14
Interference Check Samples (ICSA/ICSAB)	ICSAB %R 80 - 120% for all spiked elements | ICSA | < MDL for all unspiked elements except: K, Na	For samples with Al, Ca, Fe, or Mg > ICS levels R(+/-) if %R < 50% J(+) if %R >120% J(+)/UJ(-) if %R= 50 to 79% Use Professional Judgment for ICSA to determine if bias is present see TM-09 for additional details	17
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U(+) results < action level	7
Laboratory Control Sample (LCS)	One per matrix per batch		10
	Blank Spike: %R within 80-120%	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J(+)/UJ(-) if < LCL, J(+) if > UCL	

EcoChem Validation Guidelines for Metals Analysis by ICP
(Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Matrix Spikes	One per matrix per batch 75-125% for samples less than 4x spike level	J(+) if %R > 125% J(+)/UJ(-) if %R < 75% J(+)/R(-) if %R < 30% or J(+)/UJ(-) if Post Spike %R 75-125% Qualify all samples in batch	8
Post-digestion Spike	If Matrix Spike is outside 75-125%, spike at twice the sample conc.	No qualifiers assigned based on this element	
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples >RL and < 5x RL (Diff < 2x RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL (2x RL for solids) qualify all samples in batch	9
Serial Dilution	5x dilution one per matrix %D < 10% for original sample conc. > 50x MDL	J(+)/UJ(-) if %D >10% qualify all samples in batch	16
Field Blank	Blank < MDL	Action level is 5x blank conc. U(+) sample values < action level in associated field samples only	6
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff < RL Solid: Diff < 2x RL	J(+)/UJ(-) in parent samples only	9
Linear Range	Sample concentrations must fall within range	J values over range	20

EcoChem Validation Guidelines for Metals Analysis by ICP-MS (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration	EcoChem Professional Judgment - no qualification based on cooler temperature outliers J(+)/UJ(-) if pH preservation requirements are not met	1
Holding Time	180 days from date sampled Frozen tissues - HT extended to 2 years	J(+)/UJ(-) if holding time exceeded	1
Tune	Prior to ICAL monitoring compounds analyzed 5 times wih Std Dev. ≤ 5% mass calibration <0.1 amu from True Value Resolution < 0.9 AMU @ 10% peak height or <0.75 amu @ 5% peak height	Use Professional Judgment to evaluate tune J(+)/UJ(-) if tune criteria not met	5A
Initial Calibration	Blank + minimum 1 standard If more than 1 standard, r>0.995	J(+)/UJ(-) if r<0.995 (for multi point cal)	5A
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±10% of true value	J(+)/UJ(-) if %R 75-89% J(+) if %R = 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5A
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run ±10% of true value	J(+)/UJ(-) if %R = 75-89% J(+) if %R 111-125% R(+) if %R > 125% R(+/-) if %R < 75%	5B

Initial and Continuing Calibration Blanks (ICB/CCB)	After each ICV and CCV
	every ten samples and end of run
	| blank | < IDL (MDL)
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		refer to TM-02 for additional details
			7

Reporting Limit Standard (CRI)	2x RL analyzed beginning of run Not required for Al, Ba, Ca, Fe, Mg, Na, K %R = 70%-130% (50%-150% Co,Mn, Zn)	R(-),(+) < 2x RL if %R < 50% (< 30% Co,Mn, Zn) J(+) < 2x RL, UJ(-) if %R 50-69% (30%-49% Co,Mn, Zn) J(+) < 2x RL if %R 130%-180% (150%-200% Co,Mn, Zn) R(+) < 2x RL if %R > 180% (200% Co, Mn, Zn)	14
Interference Check Samples (ICSA/ICSAB)	Required by SW 6020, but not 200.8 ICSAB %R 80% - 120% for all spiked elements | ICSA | < IDL (MDL) for all unspiked elements	For samples with Al, Ca, Fe, or Mg > ICS levels R(+/-) if %R < 50% J(+) if %R >120% J(+)/UJ(-) if %R = 50% to 79% Use Professional Judgment for ICSA to determine if bias is present see TM-09 for additional details	17
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U(+) results < action level	7

EcoChem Validation Guidelines for Metals Analysis by ICP-MS (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Laboratory Control Sample (LCS)	One per matrix per batch Blank Spike: %R within 80%-120%	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	10
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J(+)/UJ(-) if < LCL, J(+) if > UCL	
Matrix Spike/ Matrix Spike Duplicate (MS/MSD)	One per matrix per batch 75-125% for samples where results do not exceed 4x spike level	J(+) if %R>125% J(+)/UJ(-) if %R <75% J(+)/R(-) if %R<30% or J(+)/UJ(-) if Post Spike %R 75%-125% Qualify all samples in batch	8
Post-digestion Spike	If Matrix Spike is outside 75-125%, Spike parent sample at 2x the sample conc.	No qualifiers assigned based on this element	
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples > RL and < 5 x RL (Diff < 2x RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL all samples in batch	9
Serial Dilution	5x dilution one per matrix %D < 10% for original sample values > 50x MDL	J(+)/UJ(-) if %D >10% All samples in batch	16
Internal Standards	Every sample SW6020: 60%-125% of cal blank IS 200.8: 30%-120% of cal blank IS	J (+)/UJ (-) all analytes associated with IS outlier	19
Field Blank	Blank < MDL	Action level is 5x blank conc. U(+) sample values < AL in associated field samples only	6
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff < RL Solid: Diff < 2x RL	J(+)/UJ(-) in parent samples only	9
Linear Range	Sample concentrations must fall within range	J values over range	20

EcoChem Validation Guidelines for Mercury Analysis by CVAA (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler temperature: 4°C ±2° Waters: Nitric Acid to pH < 2 For Dissolved Metals: 0.45um filter & preserve after filtration	EcoChem Professional Judgment - no qualification based on cooler temperature outliers J(+)/UJ(-) if pH preservation requirements are not met	1
Holding Time	28 days from date sampled Frozen tissues: HT extended to 6 months	J(+)/UJ(-) if holding time exceeded	1
Initial Calibration	Blank + 4 standards, one at RL r > 0.995	J(+)/UJ(-) if r<0.995	5A
Initial Calibration Verification (ICV)	Independent source analyzed immediately after calibration %R within ±20% of true value	J(+)/UJ(-) if %R = 65%-79% J(+) if %R = 121-135% R(+/-) if %R < 65% R(+) if %R > 135%	5A
Continuing Calibration Verification (CCV)	Every ten samples, immediately following ICV/ICB and at end of run %R within ±20% of true value	J(+)/UJ(-) if %R = 65%-79% J(+) if %R = 121-135% R(+/-) if %R < 65% R(+) if %R > 135%	5B

Initial and Continuing Calibration Blanks (ICB/CCB)	after each ICV and CCV
	every ten samples and end of run
	| blank | < IDL (MDL)
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		refer to TM-02 for additional details
			7

Reporting Limit Standard (CRA)	conc at RL - analyzed beginning of run %R = 70-130%	R(-),(+)<2xRL if %R <50% J(+)<2x RL, UJ(-) if %R 50-69% J(+) <2x RL if %R 130-180% R(+)<2x RL if %R>180%	14
Method Blank	One per matrix per batch (batch not to exceed 20 samples) blank < MDL	Action level is 5x blank concentration U(+) results < action level	7
Laboratory Control Sample (LCS)	One per matrix per batch		10
	Blank Spike: %R within 80-120%	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	
	CRM: Result within manufacturer's certified acceptance range or project guidelines	J(+)/UJ(-) if < LCL, J(+) if > UCL	
Matrix Spike/Matrix Spike Duplicate (MS/MSD)	One per matrix per batch 5% frequency 75-125% for samples less than 4x spike level	J(+) if %R>125% J(+)/UJ(-) if %R <75% J(+)/R(-) if %R<30% all samples in batch	8
Laboratory Duplicate (or MS/MSD)	One per matrix per batch RPD < 20% for samples > 5x RL Diff < RL for samples > RL and < 5x RL (Diff < 2x RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL all samples in batch	9

EcoChem Validation Guidelines for Mercury Analysis by CVAA (Based on Inorganic NFG 1994 & 2004)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Field Blank	Blank < MDL	Action level is 5x blank conc. U(+) sample values < action level in associated field samples only	6
Field Duplicate	For results > 5x RL: Water: RPD < 35% Solid: RPD < 50% For results < 5x RL: Water: Diff<RL Solid: Diff < 2x RL	J(+)/UJ(-) in parent samples only	9
Linear Range	Sample concentrations must be less than 110% of high standard	J values over range	20

EcoChem Validation Guidelines for Conventional Chemistry Analysis (Based on EPA Standard Methods)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Cooler Temperature and Preservation	Cooler Temperature 4°C ±2°C Preservation: Method Specific	Use Professional Judgment to qualify based to qualify for coole temp outliers J(+)/UJ(-) if preservation requirements not met	1
Holding Time	Method Specific	Professional Judgment J(+)/UJ(-) if holding time exceeded J(+)/R(-) if HT exceeded by > 3X	1
Initial Calibration	Method specific r>0.995	Use professional judgment J(+)/UJ(-) for r < 0.995	5A
Initial Calibration Verification (ICV)	Where applicable to method Independent source analyzed immediately after calibration %R method specific, usually 90% - 110%	R(+/-) if %R significantly < LCL J(+)/UJ(-) if %R < LCL J(+) if %R > UCL R(+) if %R significantly > UCL	5A
Continuing Cal Verification (CCV)	Where applicable to method Every ten samples, immed. following ICV/ICB and end of run %R method specific, usually 90% - 110%	R(+/-) if %R significantly < LCL J(+)/UJ(-) if %R < LCL J(+) if %R > UCL R(+) if %R significantly > UCL	5B

Initial and Continuing Cal Blanks (ICB/CCB)	Where applicable to method
	After each ICV and CCV every ten samples and end of run
	| blank| < MDL
		Action level is 5x absolute value of blank conc.
		For (+) blanks, U(+) results < action level
		For (-) blanks, J(+)/UJ(-) results < action level
		refer to TM-02 for additional details
			7

Method Blank	One per matrix per batch
	(not to exceed 20 samples)
	blank < MDL
		Action level is 5x absolute value of blank conc.
		For (+) blk value, U(+) results < action level
		For (-) blk value, J(+)/UJ(-) results < action level
			7

Laboratory Control Sample	Waters: One per matrix per batch %R (80-120%)	R(+/-) if %R < 50% J(+)/UJ(-) if %R = 50-79% J(+) if %R >120%	10
	Soils: One per matrix per batch Result within manufacturer's certified acceptance range	J(+)/UJ(-) if < LCL, J(+) if > UCL	10
Matrix Spike	One per matrix per batch; 5% frequency 75-125% for samples less than 4 x spike level	J(+) if %R > 125% or < 75% UJ(-) if %R = 30-74% R(+/-) results < IDL if %R < 30%	8
Laboratory Duplicate	One per matrix per batch RPD <20% for samples > 5x RL Diff <RL for samples >RL and <5 x RL (may use RPD < 35%, Diff < 2X RL for solids)	J(+)/UJ(-) if RPD > 20% or diff > RL all samples in batch	9

EcoChem Validation Guidelines for Conventional Chemistry Analysis (Based on EPA Standard Methods)

VALIDATION QC ELEMENT	ACCEPTANCE CRITERIA	ACTION	REASON CODE
Field Blank	blank < MDL	Action level is 5x blank conc. U(+) sample values < action level in associated field samples only	6
Field Duplicate	For results > 5X RL: Water: RPD < 35% Solid: RPD < 50% For results < 5 x RL: Water: Diff<RL Solid: Diff < 2X RL	J(+)/UJ(-) in parent samples only	9

EcoChem, INC.
Environmental Data Quality

APPENDIX B
QUALIFIED DATA SUMMARY TABLE

Qualified Data Summary Table
San Jacinto Texas DOT Right of Way Soil Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Lab Qualifier	Validation Qualifier	Validation Reason
K1008732	TxDOT001-SO-0-12-N	K1008732-001	ICPAES_3050B	Magnesium	1050	mg/kg	N	J	8
K1008732	TxDOT001-SO-0-12-N	K1008732-001DUP	ICPAES_3050B	Magnesium	1310	mg/kg		J	8
K1008732	TxDOT002-SO-0-12-N	K1008732-002	ICPAES_3050B	Magnesium	2010	mg/kg	N	J	8
K1008732	TxDOT003-SO-0-12-N	K1008732-003	ICPAES_3050B	Magnesium	1290	mg/kg	N	J	8
K1008732	TxDOT004-SO-0-12-N	K1008732-004	ICPAES_3050B	Magnesium	1390	mg/kg	N	J	8
K1008732	TxDOT004-SO-48-60-N	K1008732-005	ICPAES_3050B	Magnesium	1110	mg/kg	N	J	8
K1008732	TxDOT005-SO-0-12-N	K1008732-006	ICPAES_3050B	Magnesium	3000	mg/kg	N	J	8
K1008732	TxDOT006-SO-0-6-N	K1008732-007	ICPAES_3050B	Magnesium	1360	mg/kg	N	J	8
K1008732	TxDOT007-SO-0-12-N	K1008732-008	ICPAES_3050B	Magnesium	1160	mg/kg	N	J	8
K1008732	TxDOT008-SO-0-12-N	K1008732-009	ICPAES_3050B	Magnesium	656	mg/kg	N	J	8
K1008732	TxDOT009-SO-0-12-N	K1008732-010	ICPAES_3050B	Magnesium	1780	mg/kg	N	J	8
K1008732	TxDOT010-SO-0-12-N	K1008732-011	ICPAES_3050B	Magnesium	2990	mg/kg	N	J	8
K1008732	TxDOT011-SO-0-8-N	K1008732-012	ICPAES_3050B	Magnesium	2050	mg/kg	N	J	8
K1008732	TxDOT012-SO-0-12-N	K1008732-013	ICPAES_3050B	Magnesium	1820	mg/kg	N	J	8
K1008732	TxDOT012-SO-48-60-N	K1008732-014	ICPAES_3050B	Magnesium	1500	mg/kg	N	J	8
K1008732	TxDOT006-SO-0-6-D	K1008732-015	ICPAES_3050B	Magnesium	1430	mg/kg	N	J	8
K1008732	SoFW-901A	K1008732-016	ICP-AES_CLAA	Barium	0.21	ug	J	U	7
K1008732	SoFW-901A	K1008732-016	ICP-AES_CLAA	Chromium	0.4	ug	J	U	7
K1008732	SoFW-901A	K1008732-016	ICP-AES_CLAA	Copper	0.1	ug	U	UJ	7
K1008732	SoFW-901A	K1008732-016	ICP-AES_CLAA	Magnesium	50.1	ug		U	6
K1008732	SoFW-901A	K1008732-016	ICP-AES_CLAA	Nickel	0.11	ug	J	U	6
K1008732	SoFW-901A	K1008732-016	ICP-AES_CLAA	Zinc	4.2	ug		U	6
K1008732	FB-902	K1008732-017	ICP-AES_CLAA	Aluminum	2.3	ug	J	U	7
K1008732	FB-902	K1008732-017	ICP-AES_CLAA	Barium	0.26	ug	J	U	7
K1008732	FB-902	K1008732-017	ICP-AES_CLAA	Chromium	0.2	ug	J	U	7
K1008732	FB-902	K1008732-017	ICP-AES_CLAA	Copper	0.1	ug	U	UJ	7
K1008732	FB-902	K1008732-017	ICP-AES_CLAA	Manganese	0.2	ug	J	U	7
K1008732	TxDOT011-SO-0-8-N	K1008732-012	SW8270C_3541	bis(2-Ethylhexyl)phthalate	0.08	mg/kg	J	J	8,9
K1008732	SoFW-901A	K1008732-016	SW8270C_3541	bis(2-Ethylhexyl)phthalate	0.94	ug	J	U	7
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzo-p-furan	0.243	ng/kg	JK	U	22
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1668A	3,3',4,4',5-Pentachlorobiphenyl	6.55	ng/kg	JK	U	22
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	1.01	ng/kg	CJ	DNR	11
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-furan	0.0883	ng/kg	JK	U	22
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.349	ng/kg	JK	U	22
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-furan	0.137	ng/kg	JK	U	22

Qualified Data Summary Table
San Jacinto Texas DOT Right of Way Soil Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Lab Qualifier	Validation Qualifier	Validation Reason
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-furan	0.372	ng/kg	JK	U	22
E1000886	TxDOT001-SO-0-12-N	E1000886-001	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzo-p-furan	0.264	ng/kg	JK	U	22
E1000886	TxDOT002-SO-0-12-N	E1000886-002	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-furan	0.0929	ng/kg	JK	U	22
E1000886	TxDOT002-SO-0-12-N	E1000886-002	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	22	ng/kg	C	DNR	11
E1000886	TxDOT002-SO-0-12-N	E1000886-002	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.982	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-furan	0.335	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1668A	2,3,3',4,4',5,5'-Heptachlorobiphenyl	7.09	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.18	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1668A	2,3,4,4',5-Pentachlorobiphenyl	9.81	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.51	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.186	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzo-p-furan	0.185	ng/kg	JK	U	22
E1000886	TxDOT003-SO-0-12-N	E1000886-003	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	31.8	ng/kg	C	DNR	11
E1000886	TxDOT004-SO-0-12-N	E1000886-004	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	194	ng/kg	C	DNR	11
E1000886	TxDOT004-SO-0-12-N	E1000886-004	EPA1668A	3,3',4,4',5-Pentachlorobiphenyl	7.27	ng/kg	JK	U	22
E1000886	TxDOT004-SO-0-12-N	E1000886-004	EPA1668A	3,4,4',5-Tetrachlorobiphenyl	2.31	ng/kg	JK	U	22
E1000886	TxDOT004-SO-48-60-N	E1000886-005	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	1.46	ng/kg	C	DNR	11
E1000886	TxDOT004-SO-48-60-N	E1000886-005	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.341	ng/kg	JK	U	22
E1000886	TxDOT004-SO-48-60-N	E1000886-005	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-furan	0.113	ng/kg	JK	U	22
E1000886	TxDOT004-SO-48-60-N	E1000886-005	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-furan	0.395	ng/kg	BJ	U	7
E1000886	TxDOT004-SO-48-60-N	E1000886-005	EPA1668A	2,3',4,4',5,5'-Hexachlorobiphenyl	2.9	ng/kg	JK	U	22
E1000886	TxDOT004-SO-48-60-N	E1000886-005	EPA1668A	3,3',4,4'-Tetrachlorobiphenyl	3.48	ng/kg	JK	U	22
E1000886	TxDOT005-SO-0-12-N	E1000886-006	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	46	ng/kg	C	DNR	11
E1000886	TxDOT006-SO-0-6-N	E1000886-007	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	0.461	ng/kg	CJ	DNR	11
E1000886	TxDOT006-SO-0-6-N	E1000886-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-furan	0.21	ng/kg	JK	U	22
E1000886	TxDOT006-SO-0-6-N	E1000886-007	EPA1668A	3,3',4,4'-Tetrachlorobiphenyl	31.2	ng/kg	JK	U	22
E1000886	TxDOT006-SO-0-6-N	E1000886-007	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzo-p-furan	0.4	ng/kg	JK	U	22
E1000886	TxDOT006-SO-0-6-N	E1000886-007	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.182	ng/kg	JK	U	22
E1000886	TxDOT007-SO-0-12-N	E1000886-008	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	0.938	ng/kg	CJK	DNR	11
E1000886	TxDOT007-SO-0-12-N	E1000886-008	EPA1668A	2,3',4,4',5'-Pentachlorobiphenyl	12.1	ng/kg	JK	U	22
E1000886	TxDOT007-SO-0-12-N	E1000886-008	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.372	ng/kg	JK	U	22
E1000886	TxDOT007-SO-0-12-N	E1000886-008	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	0.775	ng/kg	JK	U	22
E1000886	TxDOT008-SO-0-12-N	E1000886-009	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.429	ng/kg	JK	U	22
E1000886	TxDOT008-SO-0-12-N	E1000886-009	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	0.654	ng/kg	CJK	DNR	11
E1000886	TxDOT008-SO-0-12-N	E1000886-009	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-furan	0.338	ng/kg	JK	U	22

Qualified Data Summary Table
San Jacinto Texas DOT Right of Way Soil Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Lab Qualifier	Validation Qualifier	Validation Reason
E1000886	TxDOT008-SO-0-12-N	E1000886-009	EPA1613B	2,3,4,7,8-Pentachlorodibenzo-p-furan	0.149	ng/kg	JK	U	22
E1000886	TxDOT009-SO-0-12-N	E1000886-010	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	2.45	ng/kg	C	DNR	11
E1000886	TxDOT009-SO-0-12-N	E1000886-010	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.238	ng/kg	JK	U	22
E1000886	TxDOT009-SO-0-12-N	E1000886-010	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-furan	0.273	ng/kg	JK	U	22
E1000886	TxDOT009-SO-0-12-N	E1000886-010	EPA1613B	2,3,4,7,8-Pentachlorodibenzo-p-furan	0.339	ng/kg	JK	U	22
E1000886	TxDOT009-SO-0-12-N	E1000886-010	EPA1668A	2,3',4,4',5'-Pentachlorobiphenyl	21.3	ng/kg	JK	U	22
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	25.7	ng/kg	C	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-furan	0.439	ng/kg	U,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	285	ng/kg	B,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,4,6,7,8-Heptachlorodibenzo-p-furan	58.8	ng/kg	B,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,4,7,8,9-Heptachlorodibenzo-p-furan	4.96	ng/kg	J,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1.56	ng/kg	J,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,4,7,8-Hexachlorodibenzo-p-furan	5.31	ng/kg	J,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	10.8	ng/kg	J,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-furan	2.7	ng/kg	J,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	Octachlorodibenzo-p-dioxin	4940	ng/kg	BE	DNR	20
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-furan	0.0823	ng/kg	JK	U	22
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.321	ng/kg	U,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-furan	1.8	ng/kg	JK,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	2,3,4,6,7,8-Hexachlorodibenzo-p-furan	1.71	ng/kg	J,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	2,3,4,7,8-Pentachlorodibenzo-p-furan	2.1	ng/kg	JK,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	6.15	ng/kg	D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	30.1	ng/kg	C,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	6.21	ng/kg	J,D	DNR	11
E1000886	TxDOT010-SO-0-12-N	E1000886-011	EPA1613B	Octachlorodibenzo-p-furan	287	ng/kg	B,D	DNR	11
E1000886	TxDOT011-SO-0-8-N	E1000886-012	EPA1668A	3,4,4',5-Tetrachlorobiphenyl	1.77	ng/kg	JK	U	22
E1000886	TxDOT011-SO-0-8-N	E1000886-012	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	9.8	ng/kg	C	DNR	11
E1000886	TxDOT011-SO-0-8-N	E1000886-012	EPA1613B	1,2,3,7,8-Pentachlorodibenzo-p-furan	0.696	ng/kg	JP	J	14
E1000886	TxDOT011-SO-0-8-N	E1000886-012	EPA1613B	1,2,3,7,8,9-Hexachlorodibenzo-p-furan	0.0667	ng/kg	JK	U	22
E1000886	TxDOT012-SO-0-12-N	E1000886-013	EPA1668A	Coelution of PCB 156 and 157	1.86	ng/kg	JK	U	22
E1000886	TxDOT012-SO-0-12-N	E1000886-013	EPA1668A	2,3,3',4,4'-Pentachlorobiphenyl	3.67	ng/kg	BJ	U	7
E1000886	TxDOT012-SO-0-12-N	E1000886-013	EPA1668A	2,3',4,4',5-Pentachlorobiphenyl	8.3	ng/kg	BJ	U	7
E1000886	TxDOT012-SO-0-12-N	E1000886-013	EPA1613B	Octachlorodibenzo-p-furan	0.177	ng/kg	BJK	U	22
E1000886	TxDOT012-SO-48-60-N	E1000886-014	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-furan	0.029	ng/kg	JK	U	22
E1000886	TxDOT012-SO-48-60-N	E1000886-014	EPA1668A	Coelution of PCB 156 and 157	1.97	ng/kg	JK	U	22

Qualified Data Summary Table
San Jacinto Texas DOT Right of Way Soil Sampling

SDG	Sample ID	Laboratory ID	Method	Analyte	Result	Units	Lab Qualifier	Validation Qualifier	Validation Reason
E1000886	TxDOT012-SO-48-60-N	E1000886-014	EPA1668A	2,3',4,4',5-Pentachlorobiphenyl	10.1	ng/kg	BJ	U	7
E1000886	TxDOT012-SO-48-60-N	E1000886-014	EPA1668A	2,3,3',4,4'-Pentachlorobiphenyl	3.35	ng/kg	BJ	U	7
E1000886	TxDOT006-SO-0-6-D	E1000886-015	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-furan	0.563	ng/kg	CJK	DNR	11
E1000886	TxDOT006-SO-0-6-D	E1000886-015	EPA1668A	2,3',4,4',5'-Pentachlorobiphenyl	4.33	ng/kg	JK	U	22
E1000886	TxDOT006-SO-0-6-D	E1000886-015	EPA1613B	2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.101	ng/kg	JK	U	22
E1000886	TxDOT006-SO-0-6-D	E1000886-015	EPA1613B	1,2,3,6,7,8-Hexachlorodibenzo-p-furan	0.328	ng/kg	JK	U	22
E1000886	SoFW-901A	E1000886-016	EPA1613B	Octachlorodibenzo-p-dioxin	7.04	pg	BJ	U	7

EcoChem, INC.
Environmental Data Quality

APPENDIX C
COMMUNICATION RECORDS

Melissa Swanson

From: Melissa Swanson
Sent: Wednesday, September 08, 2010 11:18 AM
To: 'Craig Hutchings'
Cc: 'Tom Schulz'
Subject: RE: E1000866 status
Attachments: DV_QUALS_20100908.zip

Hi Craig,

Here is the qualified EDD of the dioxin and PCB congener data. Multiple qualifiers were applied for ion abundance outliers (U-22), method blank contamination (U-7) and designating duplicate results (DNR-11), either dilution or column confirmation. One result each was qualified for exceeding linear calibration range (DNR-20) and chlorodiphenyl ether interference (J-14).

Please contact me with any questions you may have.

Also, we are planning to get the corrected electronic SJWP reports to you today or tomorrow, hardcopy to follow.

Regards,
Melissa

Melissa Swanson
EcoChem, Inc.
Project Chemist

710 Second Ave, Suite 660, Seattle, WA 98104
DIRECT: 206.233.9332 ext. 102 • FAX: 206.233.0114
EMAIL: mswanson@ecochem.net

From: Craig Hutchings [mailto:chutchings@integral-corp.com]
Sent: Wednesday, September 08, 2010 9:00 AM
To: Melissa Swanson
Subject: RE: E1000866 status

Melissa,
Yes, please send the qualified EDDs as soon as they are ready but hold the report until all fractions are complete. If you could provide a thumbnail sketch of why qualifiers were assigned with the qualified EDD that would be helpful. Something as simple as copying the sentence from the DV report "Data were estimated due to X and Y? would be sufficient.

Thanks.

Craig Hutchings | Scientist
Integral Consulting Inc. | www.integral-corp.com
1205 West Bay Drive NW | Olympia, WA 98502
Tel: 360.705.3534, ext. 17 | Cell: 360.485.3679 | Fax: 360.705.3669

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

From: Melissa Swanson [mailto:mswanson@ecochem.net]
Sent: Wednesday, September 08, 2010 8:36 AM
To: Craig Hutchings
Subject: RE: E1000866 status

Hi Craig,

I wanted to confirm we are holding the reports for dioxin and PCB cong. until we have completed all the other fractions? But you want the qualified EDD as they are completed.

Regards,
Melissa

Melissa Swanson
EcoChem, Inc.
Project Chemist

710 Second Ave, Suite 660, Seattle, WA 98104
DIRECT: 206.233.9332 ext. 102 • FAX: 206.233.0114
EMAIL: mswanson@ecochem.net

From: Craig Hutchings [mailto:chutchings@integral-corp.com]
Sent: Tuesday, September 07, 2010 3:05 PM
To: Melissa Swanson
Subject: RE: E1000866 status

Melissa,
That's great, I wasn't expecting anything before Thursday so it is more than acceptable.
Thanks.

Craig Hutchings | Scientist
Integral Consulting Inc. | www.integral-corp.com
1205 West Bay Drive NW | Olympia, WA 98502
Tel: 360.705.3534, ext. 17 | Cell: 360.485.3679 | Fax: 360.705.3669

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

From: Melissa Swanson [mailto:mswanson@ecochem.net]
Sent: Tuesday, September 07, 2010 3:03 PM
To: Craig Hutchings
Subject: RE: E1000866 status

Hi Craig,

Validation of the dioxins and PCB congeners is complete. I'm hoping to complete secondary today. The qualified EDD should go out by tomorrow before noon. I have an appt this evening and cannot stay past 5, I'm not sure I can finish it before then. Is that acceptable?

Regards,
Melissa

Melissa Swanson
EcoChem, Inc.
Project Chemist

710 Second Ave, Suite 660, Seattle, WA 98104
DIRECT: 206.233.9332 ext. 102 · FAX: 206.233.0114
EMAIL: mswanson@ecochem.net

From: Craig Hutchings [mailto:chutchings@integral-corp.com]
Sent: Tuesday, September 07, 2010 2:07 PM
To: Melissa Swanson
Subject: E1000866 status

Melissa,
Are you still on target for completing the DV of E1000866 PCDD/Fs? Can you also give me an ETA for PCB congeners? The data for the Aroclors, metals, VOCs, and SVOCs should be out of CAS tomorrow so you'll probably see it on Thursday.

Thanks.

Craig Hutchings | Scientist
Integral Consulting Inc. | www.integral-corp.com
1205 West Bay Drive NW | Olympia, WA 98502
Tel: 360.705.3534, ext. 17 | Cell: 360.485.3679 | Fax: 360.705.3669

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

Jeremy Maute

From: Melissa Swanson
Sent: Monday, September 13, 2010 10:08 AM
To: Jeremy Maute
Subject: FW: SJWP, K1008732, Metals wipe samples, Confirm missing Hg data

Please print this an include with your worksheets.

Regards,
Melissa

Melissa Swanson
EcoChem, Inc.
Project Chemist

710 Second Ave, Suite 660, Seattle, WA 98104
DIRECT: 206.233.9332 ext. 102 • FAX: 206.233.0114
EMAIL: mswanson@ecochem.net

From: Craig Hutchings [mailto:chutchings@integral-corp.com]
Sent: Monday, September 13, 2010 10:07 AM
To: Melissa Swanson
Subject: RE: SJWP, K1008732, Metals wipe samples, Confirm missing Hg data

Probably, but that's not CAS' fault. Just note it and review what you have.

Thanks for checking.

Craig Hutchings | Scientist
Integral Consulting Inc. | www.integral-corp.com
1205 West Bay Drive NW | Olympia, WA 98502
Tel: 360.705.3534, ext. 17 | Cell: 360.485.3679 | Fax: 360.705.3669

HEALTH ENVIRONMENT TECHNOLOGY SUSTAINABILITY

From: Melissa Swanson [mailto:mswanson@ecochem.net]
Sent: Monday, September 13, 2010 10:02 AM
To: Craig Hutchings; Greg Salata
Subject: FW: SJWP, K1008732, Metals wipe samples, Confirm missing Hg data

Hello all,

It has been brought to my attention that Hg was not reported with the wipe samples (see below). Was it supposed to be?

Regards,
Melissa

Melissa Swanson
EcoChem, Inc.
Project Chemist

710 Second Ave, Suite 660, Seattle, WA 98104
DIRECT: 206.233.9332 ext. 102 • FAX: 206.233.0114
EMAIL: mswanson@ecochem.net

From: Jeremy Maute
Sent: Monday, September 13, 2010 10:01 AM
To: Melissa Swanson
Subject: SJWP, K1008732, Metals wipe samples, Confirm missing Hg data

Hi Melissa,

I noticed that there were no Hg (7471) results for the two wipe samples in SDG: K1008732. The COC notes that metals analysis should be performed on these two samples. Can you find out if the mercury results were supposed to be reported?

Thank you.

Regards,

Jeremy Maute